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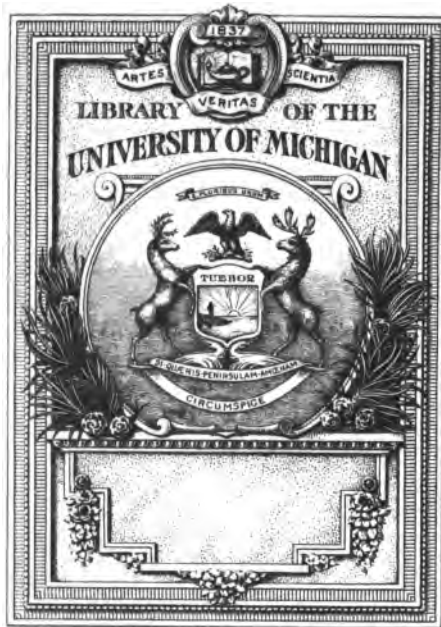
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JANUARY, 1905.

No. I.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL
SOCIETY.

PRESIDENTIAL ADDRESS ON THE SPA TREAT-
MENT OF ARTHRITIS DEFORMANS.*

BY W. BOWEN DAVIES, L.R.C.P., M.R.C.S., J.P.
(LLANDRINDOD WELLS.)

I HAVE chosen the term "Arthritis Deformans" after the German and American schools, as I think it a better name for the disease than the more often used "Rheumatoid Arthritis" or "Rheumatic Gout," for, in the majority of cases there seems to be very little rheumatism and less gout in connection with this condition.

The so-called rheumatoid affection is distinct, and requires a totally different treatment from that demanded by the others. It is especially important that it should be dissociated from rheumatism on the one hand and gout on the other, for the lines of treatment which are proper to these two respectively are both unsuitable in Arthritis Deformans. There are, nevertheless, very few patients suffering from the latter who have not at one time or another, taken drugs such as Colchicum or the Salicylates, and adopted the low diet, free from meat and

* Delivered before the British Balneological and Climatological Society, on Thursday, October 27, 1904.

alcohol, which might be suitable in rheumatism or gout. All such treatment is of course decidedly detrimental to any patient suffering from Arthritis Deformans, and it is therefore important that joint diseases should be correctly diagnosed.

I happen to have had exceptional opportunities of studying this disease during the last few years both in hospital and in private; and this must be my apology for bringing the subject forward. The disease derives its importance, not from the fact that it is dangerous to life, but on account of its power of imposing the most abject misery and progressive and painful deformity upon the unfortunate sufferers.

I have never quite satisfied myself why this disease is practically confined to the female sex, but there is no doubt that it is common about the menopause, and that it is influenced greatly by uterine and ovarian disturbances. Mental shock is a very common exciting cause, and any acute disease, especially rheumatic fever, is liable to be followed by it. It is especially prone to follow influenza.

I remember one of the first cases that impressed itself upon my memory. It was a very instructive one. It was that of a woman aged about 30, who had no gouty or rheumatic history, the wife of a farmer in seemingly prosperous circumstances. She had two children when I first saw her and Arthritis Deformans had already a good hold upon her. Her lassitude was extremely marked, and she had evidently made up her mind for a "sofa life." Shortly afterwards her husband was suddenly killed, and it was found that his affairs were in such an unsatisfactory state that she was left with her two children without a penny.

Her husband's friends came forward and offered to adopt the two children, but this she would not consent to. She said she would not part with them, but would make a home for them in a neighbouring village. This she did, and in order to gain a livelihood she took in washing. The business prospered and most of her time was consequently spent at the wash-tub.

I had lost sight of her for three years when she again called on me. I hardly knew her. She looked perfectly well: the joints had almost recovered their suppleness, the lassitude had disappeared; in fact the disease was cured.

Now what had caused this wonderful transformation ; Undoubtedly, the change in her life ; the active exercise she was obliged to take daily, and the scrubbing and rubbing. She said that at first she felt the pain in the joints very much, but after a time it passed off, leaving only the extreme general weakness. This lasted a long time, but eventually disappeared.

Many lessons are, I think, to be learnt from this case, more especially the benefit quickly obtained from the regular exercise, and what was to her, hard work.

She told me that her only medicine had been cod liver oil, of which she has taken very large quantities.

Diet.—It seems to me important that food should be taken not oftener than three times a day. What may be called "nips" and "snacks" of food or drink are very undesirable. Three times a day is quite often enough to demand work from the deranged and debilitated digestive organs. A little alcohol generally does good and may be taken in the form of sound malt liquor, stout, or a well matured light wine, or a good old whiskey well diluted with water either plain or aerated. Whichever of these is preferred, stress should be laid upon the importance of their not being taken except at meal time. Fats should be partaken of freely, especially milk and cream, in any form. Extract of malt is a useful addition to the cod liver oil. Lightly cooked eggs are always useful. Fresh butter should be taken freely, at least a quarter of a pound daily. The diet should above all things be generous and nourishing.

As I have indicated above, I regard plenty of exercise in the open air as absolutely necessary, and the more bracing the atmosphere the better. Massage in skilled hands is a very useful adjuvant. Every joint should be fully bent and extended each day, the patient should be advised to take long steps in walking and not to sit on low chairs. I recollect one case of a patient who disregarded this advice and usually sat on an extremely low drawing-room seat, which allowed the hips and knees to contract. The result was that she could only walk in a sitting posture to the end of her days.

At Llandrindod Wells most cases naturally come under the

mineral water treatment, and derive much benefit from the waters and baths. The patients usually take the waters in the following way. The hot saline, from three to six tumblers before breakfast, with a fifteen minute walk after each tumbler, and either the sulphur, in one or two five or ten ounce doses, with a twenty minutes walk after each, between 11 and 12 o'clock, and sometimes between 3 and 6 o'clock as well, or the Chalybeate, three or four wine-glassfuls two or three times a day after meals. One merit of this system is that it entails a certain amount of exercise.

The baths are found to be most useful. We never use the reclining bath in this disease, The needle-spray sulphur baths are generally preferred, supplemented by the Radiant Heat and Light Bath, which we are prescribing with increasing confidence. It is commonly advised to avoid cold and damp. No doubt this is very good advice in this and most other diseases, but patients often make it an excuse for not venturing out of the house at all excepting in the finest weather. They should therefore be told that outdoor exercise and fresh air are more important than the avoidance of damp.

Something has been said about the contagiousness of Arthritis Deformans. All I can say is that in my experience of thirty-four years, and nearly a thousand cases of this disease, I have only twice seen two members of the same family affected with it, and then failed to make out any family history of the disease. I have never come across any cases that would give me any reason to consider that the disease has been spread by contagion ; nor, in my opinion, is it hereditary. One curious point has been observed, that during the active progress of the disease, the evening temperature continues about 99° or 100° and never much higher.

The pulse, too, is usually found to be about 100. This continues for years, and is, itself, a valuable diagnostic sign. The extreme lassitude and want of energy which is so well marked in these cases is also an important symptom which, curiously enough, seems always benefited by prolonged and active exercise in the bracing air. This part of the treatment seems a painful one to the sufferers, but if used diligently before the disease becomes incurable, it is attended by wonderful results.

Original Communications.

THE TREATMENT OF STIFF AND PAINFUL JOINTS, &c., BY MEANS OF FANGO, OR ITALIAN MUD BATHS.

BY W. CECIL SHARPE, M.D.

IT has been said by a distinguished scientist that he would rather trust to the crystallisation of popular experience than to the result of scientific research. The application of hot volcanic mud, or fango, as the Italians call it, for the relief of gout, rheumatism, sciatica, and similar painful ailments, is entirely the result of popular experience, and, as in so many instances in the history of therapeutics, it is only after its value has been established empirically that one is able to suggest a scientific explanation of its action.

The therapeutic effects of fango are so striking and its application so simple, that it is not surprising that its properties were discovered at a very early date. *Thermæ* of elaborate construction, the remains of which have been found at Battaglia (Italy), demonstrate the value anciently attached to the hot springs there situated, and to the volcanic deposit, or fango found in the small lakes formed by these springs.

The name "mud bath" is familiar to every medical man, and the majority of them probably regard these baths as a strange and somewhat undesirable form of treatment indulged in by our continental neighbours. But the fact that mud baths have been in use for ages, and that they become more popular every year at all the principal foreign health resorts and bathing places, proves that there is a great deal more to be said for them than at first sight appears. Until last year the writer's acquaintance with them was limited to entire immersion in mud, moor, or peat, a procedure which certainly does not commend itself to the average Englishman.

The annual visits of several patients to Italy for the sole purpose of taking a course of fango-packs, and the enthu-

siastic terms in which they spoke of them on their return, each time greatly benefited, made it obvious that fango was a remedial agent not to be ignored and that its effects were better than could be obtained by the ordinary resources of an English spa. The fact that it was not necessary to immerse the whole body in a "mud-bath," but that a local application or *pack* was sufficient in nearly every case, also influenced one in its favour, and when it was known that fango, the Italian volcanic mud, was obtainable in England, arrangements were made for a trial of it.

Though at first sceptical of its value, and attributing a great part of its reputed effect to the change of scene and life entailed by a visit to a continental spa, each succeeding case has added to the conviction that fango has intrinsic merits of its own.

In appearance fango is a soft, greyish-brown, plastic substance of about the consistency of butter, and equally soft to the touch. It is without odour, and after application is quickly and completely removed from the skin by means of a douche of warm water, leaving the surface absolutely clean. Chemical analysis by Dr. Schneider, Vienna, shows it to be composed as follows :—

ANALYSIS OF FANGO.

	In 100 parts.
Combustible and volatile matter	10.98
Soluble in acids	41.36
Insoluble	58.64
The portion soluble in acids is composed of—	
Carbonic acid	9.34
Sulphuric acid	6.65
Oxide of iron	9.81
Silica	7.86
Phosphate	1.83
Carbonate of lime	6.05
Magnesia	1.40
Potassium } weighed as sulphates	0.94
Sodium }	

In addition there are traces of rarer metals—thorium, helium. Definite radio-activity is indicated by the electroscope.

In order to bring the fango to a proper temperature for application to the body, it is heated in a large water or steam-jacketed pan. The temperature at which it is applied is a

most important point, and it is essential that the heat should be easily regulated. The apparatus in general use is a large tinned-copper pan, with lid. The pan is surrounded by a water-chamber, and the latter is heated by a number of large Bunsen gas burners. The heating takes place slowly, but the cooling is equally slow, and once a large mass of fango is raised to the right temperature, it takes a long time, some hours, in fact, to cool. The application is, practically, a huge sterilised mineral poultice, enveloping the part affected.

The first patients submitted to treatment were suffering from chronic joint troubles, rheumatism, sciatica, rheumatoid arthritis, &c. Several of them had been under observation for some time—in one case for ten years—so that the opportunity had already been taken of trying all the usual methods of treatment, including massage, douches, packs, hot air, electric radiant heat, &c. It was thus possible to compare the effect of the fango applications with that of other methods.

The relief experienced in these cases, which were particularly inveterate ones, was at once convincing that here was a remedy which had great possibilities for the treatment of a large number of subacute and chronic ailments, and later on it was employed with excellent results in sciatica, lumbago, neuritis, back-ache (in women), cramp, chronic gout, &c., &c. In no instance did any harmful symptoms occur, but in the vast majority there was a steady and progressive alleviation of pain and stiffness, together with a diminution of swelling where such was present.

Considered merely as a vehicle for the application of heat to the surface of the body, fango has much to be said in its favour. It is a remarkable fact that in all cases of pain in the limbs or body it seems instinctive in the human species to have recourse to heat, in some form or other, for relief. All natural sources of heat have been utilised from immemorial times as "cures" for the crippled and suffering. There is hardly a warm spring in any habitable part of the world which has not been pressed into the service of man, and countless are the cures, and marvellous the properties, attributed to most of these springs.

In recent times, the most varied methods have been devised for the application of heat, local and general. Simple hot fomentations are found to give relief, but are too intermittent and tedious; packs and poultices have similar disadvantages; the vapour, or Russian bath, and the dry air, or Turkish bath, are useful advances, but quite unsuitable in many cases. Later developments are the super-heated air-ovens of Tallerman, Greville and Dowsing, all useful in their way.

It appears, then, that the application of heat is sought universally for the relief of pain, &c., and it becomes an important question as to what is the best material and method by which heat may be applied to the body.

The requirements would seem to be :—

(1) That the material should be easily adaptable to any part of the body.

(2) That it should have the property of retaining its heat for a long period.

(3) That it should be easily removed, and not injurious to the skin.

(4) That it should have no harmful influence upon the general economy.

All these properties are possessed in a marked degree by fango. It is so plastic that it can be moulded directly to the skin; once heated it gives up its heat very slowly, allowing easily of one hour or more of application at an almost uniform temperature; it is entirely removed by a brief warm douche, without the least injury to the cuticle and with no interference with the heart or other organs of the body. High temperatures can be given to one or several parts of the body, temperatures that could not be supported if given to the whole body as in peat immersion baths, Russian baths, &c. This is of great advantage in cases where the patient is suffering from heart or kidney mischief.

Another, and not the least important point in its favour, is that it is a sterilised application, being mineral and volcanic in origin, and each application being raised to a sufficient temperature for sterilisation before use.

These characteristics may serve to explain its value, though

in numerous instances it has produced such rapid and marked effects when all other heat applications have been tried and found wanting, that one cannot help the conviction that there is some unknown remedial agent in the fango itself, quite apart from its caloric-conveying qualities. Its volcanic sulphides may be accountable for some of its anti-rheumatic properties, but here again we are upon debatable ground, for we do not know how sulphur applied to the skin acts beneficially in some cases, though there is universal testimony that it does so.

A few brief extracts from notes of cases recently under treatment will illustrate the range of usefulness and therapeutic value of fango.

CASE 1.—R. H., aged 53. *Subacute Rheumatism*. Had acute attack of rheumatism eight months ago, with temperature of 104° ; in bed six weeks and laid up more or less ever since. Tried all the usual remedies, both internal and external. Both knees were seen to be swollen, puffy and tender on pressure, and in both there was a considerable amount of synovial effusion. The left ankle was tender, swollen and œdematous. The patient walked with great difficulty and much pain, and complained that the pain and discomfort were even worse at night, and quite prevented sleep, so that he had been obliged to have recourse to sleeping draughts in order to obtain rest and ease. He was put upon a course of hot packs to the painful joints, with occasional mustard application, and the Dowsing hot air bath on alternate days. There was some little alleviation of the pain at night, but the local tenderness and swelling and difficulty in walking remained. After two weeks, during which little progress was made, his treatment was changed to fango packs daily. From the first there was marked improvement. The swelling gradually diminished and the pain when standing or walking got steadily less, until, after a week, he was able to walk with a stick, and in two more weeks without any support at all. At this stage some light massage was given, and the joint carefully exercised, without any return of the effusion. After a five weeks' course the patient left practically well.

CASE 2.—Mrs. B., aged 45. *Sprained ankle* nine months ago in stepping out of a carriage, and not able to walk in comfort since ; three months ago acute pain and swelling in the foot and ankle, said to be gout. On examination the ankle joint was swollen and tender, especially over the external malleolus, where deep pressure elicited severe pain. There was limited movement in the joint. The whole foot and ankle were at once enveloped in fango packs, at first for ten minutes only, increasing gradually to three-quarters of an hour. As is often the case, the pain was rather intensified at first, but after six packs there was no longer any pain on pressure over the outer side of the ankle, and the patient was put through a course of exercises and directed to walk more freely. She continued to improve, and one month after her return home she wrote me that the pain had not returned, and that the joint was "quite supple."

CASE 3.—Mrs. P., aged 70. *Rheumatoid arthritis* many years. Hands, wrists and knees, chiefly affected. Six fango applications gave her "great comfort," to use her own words, and instead of painful and restless nights she was able to sleep well and soundly. This case was only under treatment two weeks.

CASE 4.—Mr. B. H., aged 32. *Lumbago* after long motor cycle ride three months ago. Pain very acute at first ; "tried everything." This patient was at first treated with Turkish baths, mustard packs to the lumbar region, and hot douches with massage. After a week of this there was no improvement. He was then given fango packs daily at 115° F., for thirty minutes, gradually increased to 130° for forty minutes, the lumbar region being completely enveloped at each application. After the third he was able to stoop with greater ease than for some weeks previously, and after a further course of twelve packs, he left, practically well.

CASE 5.—Mrs. J., aged 56. *Neuritis* in both legs off and on for two years, supposed to be rheumatic. Pains very severe, especially after standing or walking, and occasionally in bed. Had tried six weeks' "rest cure" with no alleviation. Both knee-jerks were rather exaggerated. No

eye symptoms, and the gait was normal. Fango packs applied to the right and left legs alternately had a curious result, the left leg getting completely well, while the right still remained painful, though less so than before. The patient was unable to stay for more than twelve applications, and her subsequent history is not available.

CASE 6.—Mr. H., aged 64. *Rheumatoid arthritis* began thirteen years ago and has steadily though slowly advanced, until many of the joints are now swollen, deformed and stiff. Fango was prescribed—four applications a week—producing the usual painful reaction at first, but with obvious improvement in mobility and reduction in swelling. A peculiarity of this case was that during the first two weeks there was a loss of five pounds in weight. At this point there was a change for the better in every respect, and the weight went up until in two months nearly a stone had been gained. This patient had been treated twice a year for the same complaint off and on for some years, and he volunteered the statement that it was the most satisfactory and effective application he had ever tried.

CASE 7.—Mr. H. J., aged 56. *Coxa vara*, described by the patient as “chronic sciatica.” Has had Greville and Dowsing baths with no effect, and the usual hydrotherapeutic applications were tried without avail. He had a course of six fango packs enveloping the hip from buttock to groin, and to midway down the thigh. There was marked improvement in mobility, and the pain was much reduced—results which were all one could hope for in a case of this sort.

CASE 8.—Mrs. R. F., aged 42. *Old injury to ankle*. Two years ago severe sprain. There was limited movement from adhesion, and pain on pressure all round the joint. Fango packs thrice a week at 120° for thirty minutes, followed by massage, and the Aix douche on alternate days, increased the local discomfort at first, but after six weeks both pain and stiffness had gone, and the patient was able to walk freely.

CASE 9.—Mr. A. C., aged 43. *Locomotor ataxy*. Lightning pains in arms and legs, between ribs, and everywhere. Fango

was applied daily to the regions affected. The pains were greatly alleviated, and after eight or nine days were hardly perceptible, the patient being able to sleep in peace, instead of being tortured by the terrible twinges of pain he had been accustomed to.

CASE 10.—Mrs. W., aged 60. *Rheumatoid arthritis* ten years; all joints more or less affected; knees and hips and hands chiefly. This patient had been under observation for some years, and every known method of treatment had, at one time or another, been tried with some measure of relief. As the knees were becoming contracted, and the legs aching badly from the increased difficulty in walking, entailed by the impossibility of properly straightening the legs, it was decided to try fango packing chiefly to the knees. They were swollen and tender, with the usual thick synovial exudations round the joint. After the first six packs marked improvement set in. The measurement about the knee joints were as follows :—

				Right.			Left.
3in. above the knee	...	...	...	23in.	...	...	21½in.
Across joint	...	...	...	21in.	...	...	21¾in.
3in. below	...	...	...	18½in.	...	...	18½in.

After two weeks the measurements were reduced by 1 in. and after four weeks by 1½ in. in both joints. There was much more freedom of movement, the patient being able to extend the legs nearly to their natural limit. She could also walk better than she had been able to for a long time, and her general condition was greatly improved. Six months after, she reported that she had been much better able to walk, and that the contraction of the knees had not returned.

CASE 11.—Mr. P. I., aged 75. *Rheumatoid arthritis* in right knee; began three and a half years ago. Had tried baths, &c., &c., at most of the watering places, and had also had a course of radiant heat and Tallerman baths. The joint was not much swollen, but there was an acutely tender area along the inner margin of the joint, and considerable grating on movement. After a four weeks' course of fango packs, with light massage, there was a diminution in the local tenderness, and considerable improvement in walking powers. This patient expressed the opinion that it was the most effective form of treatment he ever

had, and there is no doubt that he had tried sufficient remedies to enable him to be a competent judge.

CASE 12.—Mr. F. S., aged 30. *Rheumatism (Gonorrhæal)*. The knees and feet were chiefly affected, swollen, painful and stiff. After a course of one week, the joints were much more painful, but a continuance for another week brought relief, and after the fourteenth pack the knees were less painful, and could be freely flexed and extended. The feet continued stiff and painful on attempting to walk much, and the patient promised to return for a further course.

CASE 13.—Miss G., aged 45. *Sciatica*. Her doctor wrote : “She has been a sufferer from attacks of rheumatism and sciatica for years, but really badly for some months past, so that lately she has had little sleep. The sciatica is chiefly confined to the left leg, and there is a good deal of lumbago. She has lost flesh, especially in the limbs. The usual remedies, salicylates, alkalis, liniments and aperients, and lately morphia, have been tried, but with none but the most temporary effect.”

The left thigh and the lumbar region were enveloped in fango packs daily in turn, beginning at 110° F., for ten minutes, and gradually increasing to 125° for twenty, thirty, and forty minutes. After ten days, the acute symptoms had so far subsided that sleep was obtained without sedative. Light massage was then prescribed, twice daily after the packs, for ten to fifteen minutes. In three weeks the patient was able to walk without much pain or difficulty, and in six weeks returned home well.

These few cases will be sufficient to indicate the direction in which fango has been found most useful.

In recorded notes of seventy cases treated with fango applications, only four failed to get some measure of relief. In thirty chronic cases, of some months to many years' standing, the relief was substantial, and in thirty-six recent rheumatic, gouty, and traumatic cases the trouble was entirely removed.

The physiological effects of fango may be stated as follows :—

(1) Stimulation of cutaneous reflexes, with dilatation of superficial capillaries.

(2) Increased activity in the normal processes of absorption of morbid deposits, and repair of damaged tissues.

(3) On the system generally there is a marked effect, the entire skin surface perspiring freely, thus ensuring increased excretion and elimination.

(4) Slight increase of the body temperature, rarely exceeding 2° F., subsiding rapidly after removal of the pack, and probably due to direct heating of the blood.

The list of hot applications for the relief of pain is a long one, from the fig of Jeremiah or the warm dripping hide of a newly-killed goat of Kruger, to the hot bran, bread, linseed, or more elegant starch poultice; and from the hot sun or sand bath of primitive man to the elaborate electrically heated ovens of the present day. Among all these there are none so convenient and effective as the hot natural volcanic mud of Battaglia, and none which, in the writer's experience, has such marked remedial effect. In it will be found one more therapeutic agent for the relief of a most difficult class of ailments, and not by any means the least efficient of those at our disposal.

NOTES ON THE SANATORIUM TREATMENT OF PHTHISIS AND ITS PRESENT LIMITATIONS.

BY CHARLES J. WHITBY, M.D.CANTAB. (BATH).

AT the suggestion of a valued friend, I venture to submit some impressions of my experience of the sanatorium treatment of phthisis on what may now fairly be called the orthodox lines. During my superintendence of the Mendip Hills Sanatorium, a fair number of patients passed through my hands, but by no means enough to justify my advancing original statistics based thereon, as to the general results of the open-air treatment. But there are other means of estimating the value of a given method besides the strictly arithmetical; what one might call the direct clinical appraisal of results, is by no means always to be despised. And inasmuch as I am unlikely to undertake any such official responsibility in the future, I can at all events claim now to speak with entire impartiality. The *rationale* of the purely hygienic treatment of phthisis rests largely on the established fact that spontaneous recovery is by no means rare. Thus in 1880, Dr. Heitler, of Vienna, brought forward an analysis of 16,562 autopsies, in which, excluding all cases of death from pulmonary tuberculosis, he found that there were no fewer than 780 instances (almost exactly 5 per cent.) of the presence of obsolete tubercular masses.¹ In statistics drawn exclusively from the poorest class, an even higher proportion of tubercular lesions is, I believe, the rule in this country, for I remember to have read that in one of our large workhouse infirmaries, such lesions, healed or otherwise, were found in about 30 per cent. of all autopsies, irrespective of the cause of death. Since, therefore, the unrecognised occurrence and the spontaneous involution of tubercular disease of the lungs is, beyond controversy, a more or less common occurrence, what can be more reasonable, in default of any specific of proved value, than the placing of phthisical patients under approximately ideal hygienic conditions, in the hope that Nature herself may effect

a cure? We have no means of attacking the local disease directly, and must therefore content ourselves with fortifying the constitution, and so augmenting the chance of survival until natural immunity has been established. But whereas this natural immunisation is a very slow and gradual process, the disease itself is, from first to last destructive, and destructive of vital organs. If immunity can be induced, naturally or artificially, before the destructive process has gone too far, involution occurs, the tubercular lesions become obsolete, and we have what is called a cure; but only in exceptional cases, and in such, too, as have come under treatment at a very early stage, can the cure be called absolute. In all others the lungs at least, and too often other organs, are more or less crippled by the results of the tubercular process. Thus, in statistics as to the after history of sanatorium patients, we often find cases of permanent arrest, without fitness for work. The patient is no longer consumptive, but he is and must always remain to some extent an invalid.

In entering upon my duties at an open-air sanatorium, although I never made the fundamental mistake of despising my enemy, I was perhaps unconsciously influenced by the wild claims made on behalf of the treatment by fanatical advocates in the press. One must have lived in the midst of a phthisical community, must have been responsible for the welfare of its individual members, in order to appreciate fully the insidious treachery of tubercular disease. The most constant vigilance will hardly avail for a trustworthy anticipation of the course of events in every case. The most serious complications may develop without premonitory symptoms, and may suddenly revolutionise one's view as to the outlook for the patient concerned. Here is a case in point. A youth of 19, suffering from early consolidation of the right apex, after gaining $15\frac{1}{2}$ lbs. in six weeks, and making steady progress in other ways, complained one morning, when on the point of starting for his walk, of pain in the right subpectoral region. The weather, though fine, was extremely cold, and he was advised by his fellows to see me at once. He insisted, however, on going for his walk, but on his return, feeling much

worse, went to bed. I found him in a high fever and in the course of the next few days well-marked physical signs of infiltration appeared in the left lung (hitherto free) while those in the right lung rapidly extended. The pulse rose to from 120 to 140, and remained constantly rapid, full and bounding. The increased weight was maintained, but the pyrexia continued, the number of bacilli increased, and he died within three months of his relapse. It is in such cases that one feels the limitations of hygienic treatment, and longs for some direct method of attack. "To do something" is one's pressing instinct, but there is so little that one can do. To choose a sheltered, moderately elevated site for one's sanatorium, to open its windows, to provide abundance of good food and to see that it is eaten, to regulate with precision the exercise and rest of individual patients: all this is very good, indeed essential, but when all this has been done we have only laid the foundations, or established the preliminary conditions of a genuine cure of consumption. The real work remains to be done, or so it seems to me. And that this feeling is shared by the medical officers of some of our private sanatoria is proved by the growing attention devoted at such places to intravenous injections of various antiseptic solutions, cataphoresis, high-frequency treatment, inhalations of formaldehyde, and the like. To sera and tuberculins resort is widely made. I am credibly informed that in Switzerland no less than forty tuberculins are in use, all equally ineffective.*

One of the few positive elements of orthodox hygienic treatment is the external application of water with a view to enhancing the general hardening effect of sanatorium life. At the best German institutions considerable stress is laid upon this part of the system, and proper provision is made for its use, but there is reason to fear that in this country it is in too many cases neglected. Quite recently I wrote to the resident physicians of ten English sanatoria, chosen at random from the twenty or thirty advertised in the medical

* I do not wish to be understood as endorsing this condemnation.—
C. J. W.

press, and requested information on the point. At three only of the eight institutions from which I received replies, douches or baths at prescribed temperatures, or ablutions in more severe cases, form a regular part of the daily routine of treatment. At three others a more or less perfunctory resort to hydrotherapy is made in some few cases, and at two it is never used. From two institutions I received no reply, and we may conclude that there was probably nothing to communicate. Now, inasmuch as hydrotherapy, to be of any use, must be thoroughly and persistently carried out, I think it is a pity that this is the case only at three out of these ten important institutions. The judicious application of water in some form adapted to individual requirements constitutes a powerful and flexible means of educating and fortifying the resisting power of the organism. In Baruch's "Hydrotherapy"² the simple technique is described, and details are given of many grave cases in which, by such treatment, practically unaided, complete arrest, with absolute disappearance of clinical and bacteriological evidence of disease, was brought about.

In estimating the value of the sanatorium treatment, the beneficial effects of residence at a moderate elevation, such as is usually chosen if possible, should not be overlooked. The Mendip Hills Sanatorium stands about 850 feet above sea-level. In my opinion, the constant inhalation of an atmosphere even slightly more rarefied than that to which the patient has been accustomed, produces important effects. In order to obtain sufficient oxygen somewhat deeper respiration is needed. To live in such an atmosphere constitutes a sort of insensible but perpetual breathing exercise, and the result is shown in an almost inevitable increase of the thoracic girth as measured at the end of deep inspiration. Increase in the girth as measured at the end of expiration is also common, though less marked as a rule, and sometimes absent. Of nine patients in whom the thoracic maxima were recorded on entering and leaving, the average increase at the end of inspiration was $1\frac{1}{8}$ in., and that at the end of expiration a little over $\frac{1}{2}$ in., the average duration of residence being about

ten weeks. One patient, after six months, showed an inspiratory increase of 3 in. the expiratory girth not being perceptibly changed. Another, in seven weeks only, increased his inspiratory girth by $1\frac{1}{4}$ in. and his expiratory $1\frac{1}{4}$ in. During the same seven weeks this last patient, who had a cavity of moderate size at one apex, gained $19\frac{1}{2}$ lbs., so that in this case an increase of the fleshy covering of the thorax is doubtless to be allowed for. But this explanation does not account for those cases in which the inspiratory girth alone is perceptibly increased.

A practical point which I should like to mention here is the importance of a rapid pulse as affecting the prognosis. In almost every case which I have known to terminate fatally, a constant pulse-rate of 100 to 140 has been recorded. I believe that heart-failure from habitual tachycardia is the commonest cause of death in consumption. The temperature, important as it is, ranks to my mind second to the pulse-rate as an element of prognosis, and I am glad to notice that my successor at Hill Grove, Dr. Chowry Muthu, is of the same opinion.³ A fall of temperature which leaves a rapid pulse unchanged will seldom indicate substantial amelioration.

With regard to the supposed significance of an increase of weight, you probably share my own disillusionment. It is a good sign, no doubt, so far as it goes; yet a patient who is going steadily downhill may sometimes continue to put on weight. The fact must be borne in mind in estimating the chance of a patient's recovery, or it may lead to a serious error.

Before submitting what little evidence I have collected as to the results of sanatorium treatment in this country, I will quote von Jaruntowsky's statement of those obtained in Germany.⁴ Of 5,440 patients treated by Brehmer at Goerbersdorf during the eleven years ending in 1886, detailed reports are available concerning 5,032. Of these, 1,390 were admitted during the first stage of disease, 2,225 during the second, and 1,517 during the third. Of the early cases, 27.8 per cent. are classed as cured and 31 per cent. as nearly cured. Of the cases in the second stage, 6.83 per cent. were cured and

14·6 per cent. nearly cured. Of advanced cases, 0·84 were cured and 2·3 per cent. nearly cured. Of all cases taken together, 11 per cent. were cured, 15·6 per cent. nearly cured, *i.e.*, 26·6 per cent. were discharged in a satisfactory condition. Special enquiries made regarding some of Brehmer's cases in 1890, showed that in 5 instances the cure had lasted twenty to twenty-nine years, in 52 from twelve to twenty-one years, in 38 from seven to twelve years. Of 40 patients dismissed as cured, or nearly cured, in 1876, there were, fourteen years later, still 25 patients living in good health; one had died of phthisis, and 13 from causes unknown. Statistics are also given by von Jaruntowsky of the results at Falkenstein, St. Blasien and Reiboldsgrün, which go to confirm the conclusion that about 25 per cent. to 27 per cent. of cures, including relation cures, is the usual proportion, although a considerable number in addition show more or less marked improvement. Of 99 patients leaving Falkenstein as cured, 72 were living from three to nine years later in perfect health. We may safely conclude that in a large proportion of cases discharged as cured no relapse need be anticipated.

Turning now to our home sanatoria, we find in the first annual report of the Worcestershire Sanatorium, particulars of 36 discharged patients.⁵ Of these, arrest was obtained in 18; in 9, substantial improvement; and in 9, no benefit. This gives a percentage of cures amounting to 50 per cent. But it is to be noted that of the total 36, 18 were first-stage cases, and in 7 no tubercle-bacilli were found. The fact is that, at public sanatoria, careful selection is necessarily the rule, and the percentage of grave cases is, consequently, much lower than at private ones. Dr. Burton-Fanning has favoured me with a reprint of his *Lancet* article, detailing the results obtained at Mundesley Private Sanatorium with 143 patients.⁶ Of these, a proportion equal to 63·6 per cent. were advanced cases. The results were:—(1) in 32·86 per cent. arrest with fitness for work; (2) in 25·17 per cent., arrest with inability to work; (3) in 26·57 per cent., improvement; (4) in 15·38 per cent., no improvement. It is four years since some of these patients came under notice, and of the 143, 43 are now dead and 40 still fit for work.

Dr. Mathu, at Hill Grove, treated 100 cases, in 28 of which he reports complete arrest, in 40 considerable improvement, but with persistence of moist râles, and in 11 slight improvement.⁷

The medical officer of Westmoreland Sanatorium informs me that of 37 early cases discharged before January, 1904, 32 are quite well, and 4 more well enough to work. Of 49 moderate cases, 29 are quite well, and 10 more able to work. Of 67 advanced cases, 9 are well, and 8 more well enough to work.

These figures are enough to prove that good work is being done in our own sanatoria, but they are not comprehensive enough, either as regards numbers, or the time covered by recorded observations, to justify a comparison with the Falkenstein results. Taking these as our standard, it appears that even if all cases could be brought under treatment during the first stage, over 40 per cent. would receive little benefit. Much remains to be done before we can claim to have got the upper hand of the disease which is responsible for 10 per cent. of the deaths in England and Wales, and from which at least 250,000 of our fellow countrymen are now suffering. Let us hope that research may furnish a remedy which may complete the efficacy of the sanatorium treatment.

Finally, as contributions to the question whether a given patient shall be sent to a sanatorium or not, I submit the following considerations :—

(1) The earlier and milder the case, the more likely is it to receive lasting benefit.

(2) Of moderate cases, those in which cavitation without fever exists, often do better than those with much fever and without cavitation.

(3) A patient destined to recover generally shows improvement from the date of his arrival. In doubtful cases a month's probationary residence may therefore be advised.

(4) Cases complicated by bronchitis and violent cough do badly at sanatoria situated in bleak or exposed places, especially during the winter.

(5) Neurotic patients, taken early, often do well at sanatoria, but not those who for more substantial reasons require much nursing.

(6) Phthisis, being a contagious disease, should, for the good of the community, be treated in sanatoria in all cases where no strong contra-indication exists.

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- ² Baruch's *Hydrotherapy*, pp. 347-358.
- ³ *B.M.J.* November 1, 1902.
- ⁴ *Sanatoria for Consumptives*. Von Jaruntowsky, pp. 36-39.
- ⁵ *First Annual Report of the Worc. Assn. for Prevention of Consumption*. Year ended December 31 1903
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ON SOME GENERAL INDICATIONS OF VICHY.

BY EDOUARD MARGNAT, M.D. (VICHY).

AFTER having for several centuries enjoyed a certain celebrity, the Vichy Springs have acquired, during the last forty years, a popularity which no other watering place can hope to emulate. Vichy was already much in favour at the time of Mme. de Sévigné, but we see the place spring up into fresh fame after the oft-repeated visits of Napoleon III.

From that time, indeed, date the first really scientific works and observations which, carried on to this day, give these waters a well defined place in the treatment and cure of a number of diseases. It is, therefore, not by relying upon hypotheses or probabilities, or even upon a limited number of observations, that one is now able to discuss the virtues of Vichy waters, but by the light of long clinical experience.

I will endeavour to set forth the main points of this experience, and point out as briefly as possible the general applications round which the others do but group themselves.

Vichy is, first of all, recommended in dyspeptic and hepatic diseases, and also in a certain number of constitutional diseases such as diabetes, gout, chronic rheumatism, nephrolithiasis.

Every year many dyspeptic patients find their digestive functions improving under the treatment. In such cases, this is what happens: after a few days the appetite increases sensibly, the digestion is less laborious, the sensation of distention after meals is less marked, the heart-burn towards the end of the digestion becomes rapidly less, and ultimately altogether disappears. And these signs improve as the cure nears its end. In connection with this, comparative examinations of the gastric juice show a notable increase in the HCl, the disappearance of mucus and fermentative material.

The effects of the treatment are, therefore, first a stimulating action upon the secretion of HCl, then a sedative action as regards the pains and vomiting, and lastly, an antiseptic action by destroying the excessive fermentations.

It is for this reason that Vichy gives such good results in

that form of dyspepsia which obviously results from insufficiency of HCl. In this category may be placed the digestive troubles of large eaters and heavy drinkers, those that follow infectious and toxic diseases as influenza, enteric fever and the like. The subject of dilatation of the stomach deserves a special place where the cure of Vichy is concerned. Thanks to the salutary effect of the waters, we can often obtain complete recovery in cases where the dilatation is slight; and even if the cure is not complete after a first treatment, the condition becomes progressively ameliorated when several courses are taken in consecutive years. A considerable diminution of the gastric cavity, following upon the improvement in the chemical action, can be plainly traced. But when we have to deal with a large dilatation, when the motor power is practically in abeyance, then the result of the Vichy treatment can be but partial, and the patient should have recourse to surgery, for then gastro-enterotomy has become a necessity. It is only after such an operation that there will be any advantage in a course of the waters calculated to restore a normal secretion. If the dilatation is due to a mechanical obstruction, it is needless to say that Vichy can produce no effect whatever.

Our spa seems especially well adapted to the treatment of a great number of diseases of the liver. From the very first days of the treatment a more active circulation in the liver is observed, and the resulting increase of the tension sometimes produces a certain amount of discomfort, which is, however, of short duration. The circulation in the liver is stimulated, and all the physiological functions of the organ receive a favourable impulse; the biliary secretion is increased, the glycogenic function is regulated, and there is an increase in the antitoxic power—the power whose existence the experiments of Sir Lauder Brunton and of Bockenham have recently further demonstrated. As regards its effects on the ureagenic function, it is only necessary to see how quickly the normal proportions in the elements of the urine are reinstated, to be able to judge of the efficacy of the cure in this direction.

Congestions of the liver and alcoholic cirrhosis are types of the diseases in which the favourable action of the waters

upon the circulation is manifest; and when I speak of cirrhosis I do not of course mean its last stage. I mean incipient cirrhosis with enlarged or only slightly contracted liver, with slight or no ascitis, with or without jaundice. These cases are improved very considerably, and sometimes to a greater degree than could ever have been anticipated. For instance, I attended six years ago a lady patient whom her doctor had sent to undergo a course of treatment for alcoholic cirrhosis. Her general state was such as to throw me into great perplexity, and I was asking myself whether treatment would be of any avail.

She was a pronounced alcoholic, but comparatively young, 32 years of age, emaciated, with a subicteric complexion, numerous varicosities on the skin, a liver reduced in volume and some ascitis. The stomach also was not working properly. Despite her precarious state she was able to follow a cure of mean severity. She had vastly improved, when she went away after a month's stay; and I have learned since that this patient, who has given up her drinking habits, now enjoys well-nigh normal health. Such results are also observed in cirrhosis following upon malaria and cholelithiasis.

I have said that the biliary function was improved by the hydro-mineral cure. The great influence of the waters in the elimination of calculi is obviously due to this effect. The patients never expel so many of the latter as during and after their cure, and we can place biliary lithiasis among the diseases which Vichy waters are most certain to benefit. It is rare that a few consecutive cures do not entirely disperse them, and though they cannot obviously claim to dissolve the large stones which fill the gall-bladder, there is no doubt that they tend to expel those of smaller and middle sizes. Furthermore, they modify the state of the liver so as to prevent the formation of fresh calculi.

As regards those patients who have gall-bladders filled with many stones, or with a small number of them but of large size, it is evident that "as soon as they give serious trouble their removal by operation is the most rational method of treatment" (Mayo Robson). After the operation it is often good for the patients to undertake a hydro-mineral cure. Two

years ago a lady patient was sent to me who had undergone an operation three months before for gall-stones which had necessitated the complete ablation of the gall-bladder. All had at first gone on satisfactorily; but one month later the attacks of hepatic colic had returned, and became of daily occurrence with the passage of small calculi. These attacks disappeared almost entirely after thirty days' treatment at Vichy, and since the second course, which she followed at the end of the same summer, she has never had any return.

In the matter of diabetes I will endeavour briefly to show the wholesome effect of the mineral water in alimentary glycosuria, and I will refer in passing to the fact that in all cases of hepatitis following the various infections, the results are equally favourable.

The Vichy treatment is advantageous to fat and gouty patients, to all patients whose disease is slow in its evolution, and lastly, to a numerous group of patients who are properly styled glycosuric. In all these cases a rapid and permanent improvement of the major symptoms is noticeable, and their ultimate disappearance may even be expected from a course of the waters.

We see constantly that after a few days, the muscular weakness and the thirst are checked, and if with a few patients glycosuria persists, it is always very much attenuated.

In the case of the thin patients, in whom the disease makes such rapid progress, they have nothing to expect from the hydro-mineral cure.

Gout and gouty rheumatism are improved probably by an analogous process. After treatment the attacks become less frequent and less intense; they even disappear when the patient consents to follow several consecutive cures. As regards the alternating attacks of gout and diabetes which are frequently observed in the same patient, they yield to an identical treatment and with equally satisfactory results.

During the first few days of a cure, especially with gouty patients, a large elimination of uric acid sand, which soon completely disappears from the urine, is observed to take place. This explains what occurs in the case of renal

calculous affections : first a washing of the kidneys and the carrying away of all existing gravel ; then, by means of a mechanism which probably has its seat in the liver, an increase in the oxidising processes and thus a check to the formation of fresh calculi. This double action, in connection with the uric calculi, is precisely that which distinguishes Vichy from other spas which have a reputation in renal lithiasis. In these latter the action seems to be due rather to free diuresis, and it is by the ingestion of a great quantity of water that the best results are obtained. At Vichy but a small amount of water is consumed, and diuresis, although playing a certain part, is but a secondary consideration.

To be more complete I ought to point out the good results obtained in albuminuria without nephritis, *i.e.*, in toxic albuminuria, in anæmic states following upon tropical diseases, in a certain number of cases of obesity, and lastly, in many cases of muco-membranous entero-colitis associated with diarrhœa.

I think I ought not to conclude this brief review without pointing out those diseases which are a counter-indication to the Vichy cure : these are cancerous and other malignant diseases, especially in the visceral tract, tuberculosis, incompletely compensated cardiac diseases, and advanced arterio sclerosis.

After the eulogistic descriptions and accounts which have appeared in the writings of Dr. Burney Yeo, and in these very columns by Dr. Leonard Williams, it would be superfluous on my part to say anything of the physico-therapeutic resources of Vichy, nor need I add that this place possesses the most complete and most modern plant installed in an establishment which leaves nothing to be desired as regards comfort and hygiene.

And it is by the expression of a wish that I should like to bring this to a close, namely, that more of our English *confrères* would themselves visit Vichy in order that they might realise not only the infinite therapeutic resources of the place, but also acquaint themselves with the excellent accommodation and numerous facilities for amusement which are offered to visitors.

A NOTE ON NAPLES.

H. B. SYMONS.

THE topographical features of Naples are not only of importance climatically, but they also afford a key to some of the sanitary questions which have affected Naples in the past.

Shut in on the north and west by hills, and on the south by the sea, Naples can only extend, naturally, to the east, whence spreads a vast plain, and from which Mount Vesuvius rises, more or less abruptly, in the centre.

The town itself may be said to be divided, roughly, into two parts by a ridge, reaching from St. Elmo above, to the Pizzo Falcone below. That to the east is the older. The western and newer part of Naples may be regarded as the most desirable residential quarter, and it is here that the visitors' hotels are found.

Situated, then, on the sea-coast, and in an era before it could be reached by rail, Naples became the seat of government ; fostered also as it was, to the exclusion of the remainder of Calabrian territory, it enjoyed for long, a measure of prosperity which the events of 1860 ultimately swept away. With the new order of things came increased taxes and the vastly augmented cost of food-stuffs. A crisis was reached a quarter of a century later, when Naples was visited by the cholera. Deplorable in its immediate effects, as in the condition which it revealed as existing amongst the poorest of the city, the need of sanitary reform was brought home to all classes in no uncertain tone.

The immediate result was the *sventramento*, or gutting of vast areas of the most infected quarters. Whilst modern means of traction has done something to ameliorate the condition of congested parts, overcrowding still remains grave in the poorer districts.

The geological features here merely require reference to be dismissed. The whole of the northern shore of the bay, and for

some distance inland, is of volcanic origin—so, likewise, is the concavity of the bay eastwards. The Sorrentine peninsula, which forms its southern boundary, is of lime-stone.

The present *water supply*, instituted subsequent to the cholera epidemic, is satisfactory. It is supplied by meter, an average of 300 litres being allowed for each inhabitant daily.

The new and efficient drainage system is now being energetically pushed forward to completion. Under this head, and in view of the fact that Naples is still regarded, very generally, with something more than suspicion from a sanitary aspect, it may be stated that enteric fever (the *bete noir* of the traveller), contributes no greater percentage to the public mortality than is the case in our own favoured metropolis. The death rate of Naples is that of Italy generally.

TABLE OO.

Total number of Enteric Cases occurring in Places named for the First Six Months of 1903. Ratio of Population between London and Naples being 5:1 (circa).

1903.	January	February	March	April	May	June
Naples	3	7	5	10	3	3
Rome	15	(?)	15	15	17	—
London	82	69	(?)	51	88	248
Paris	17	30	88	32	38	42
New York ...	88	(?)	(?)	77	102	122

The foregoing table, compiled from such figures as are available at the time of writing, though representing London in an unduly bad light, assists in supporting foregoing remarks.

It has been well said that climates have the defects of their qualities; for example : a mild, equable climate may be rainy and, perhaps, sunless ; whereas a dry, sunny one is more often windy and subject to excessive variation of temperature.

The most prominent feature of the climate of the Bay of Naples, which experience and a study of meteorological records imparts, is its extreme equability, the surrounding hills in no small measure contributing to this.

With equability, the city of Parthenope presents mildness,

sunshine, and a moderate humidity. The temperature generally is two or three degrees warmer than Riviera Ponente. The showery weather of the British Isles is rare. Extended rainy spells, however occur.

There is an absence of bise or mistral.

During the winter the Sirocco Levante, a south-easterly wind of a hot enervating description is occasionally observed bringing in its train a sense of discomfort and depression, even to the most robust. The occasions of its appearance are however, sufficiently rare. During the summer months the Libeccio (S.W.) blows morning and evening, affording welcome relief from the heat of the day.

No European climatic station can be said to be exempt from periods of cold, but the fact that heating arrangements are virtually unknown in Neapolitan homes, either of rich or poor, must be taken as evidence that cold in Naples can neither be excessive or of long duration.

METEOROLOGICAL DATA.

(Royal Observatory. By 149 above level of the sea.)
1866-1900.

Naples is situated in lat. $40^{\circ} 52'$, long. $14^{\circ} 15' 45''$ F.

The mean annual temperature is $15^{\circ} 80\text{C}$. Absolute variation from this being $1^{\circ} 48$.

The following table I A, I B, indicate the same temperature of months and seasons. Table I C shows monthly maximum and mean.

TABLE I A.

Mean Monthly Temperature (Centigrade). 1866-1900.

Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
8.24	9.04	10.71	13.74	17.69	21.29	24.14	23.96	21.44	17.19	12.67	9.44

TABLE I B.

Mean Temperature of the Seasons (Centigrade). 1866-1900.

Winter	Spring	Summer	Autumn
8·89	14·05	23·13	15·79

TABLE I C.

Maximum and Minimum Mean Monthly Temperatures (Centigrade). 1866-1900.

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Maximum	10·90	12·19	14·07	17·39	21·70	25·41	28·43	28·34	25·30	20·45	15·54	11·91
Minimum	6·07	6·60	7·93	10·67	14·18	17·63	20·36	20·34	18·22	14·53	10·39	7·39

During the period under examination, the day temperatures remained below 0 C. on one occasion only, *i.e.*, January 25th, 1869, when snow fell.

The minimum mean of any single month has never descended below 5 C.

It may be noted that, whereas the extremity of heat is reached in August, the hottest month is July. On the other hand, extremities of cold are actually met with in the coldest month, *viz.*, January.

TABLE II.

*Relative Humidity—**Mean Annual, 69·0—for the respective Seasons, 1866-1900.*

Winter	Spring	Summer	Autumn
71	68·6	64·5	71·1

Tension of vapour, mean annual	...	10·10
Nebulosity, mean annual	...	4·3
Days of cloudless sunshine	...	162
Mixed (cloud and sunshine)	...	106
Covered or cloudy	...	97

The maximum of cloudy days occurs in December. The average of perfectly cloudless days, during the early months, may be of interest, and is shown below. (Table III.)

TABLE III.

	1866—1900		
	January	February	March
Sunny days	10·89	10·44	10·00
Mixed days of cloud and sunshine	7·50	9·04	10·37
Maximum of sunny days recorded } in month specified	17·00	20·00	18·00

It will be seen, therefore, that considerably over half the days of the months named are more or less sunny on any average.

Rain.—Palermo records 116 rainy days ; 29 inches ; falling almost entirely during the winter months. Naples—113—chiefly in the autumn, October being the month in which most rain falls.

TABLE IV.

Rainfall, Mean Monthly (in Mm.). 1866—1900.

Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
97·54	63·17	73·12	75·67	53·42	31·64	19·12	23·88	69·56	125·63	112·08	120·70

The rainfall occurring chiefly in the early and late months of the year, places Naples in the southern rain zone.

Snow.—During the last thirty-five years snow has fallen forty-five times—chiefly during the night.

The average, during the day, is about once in five years.

Wind.—The prevailing wind during the winter months is N. or N.E., then S.W. In the remaining months, this last passes into the first line, and is followed by N.E. in March, October and November, and by W. in the remaining months from April to September.

CHAPTERS IN BALNEOLOGY.

I.

BY THE LATE SAMUEL HYDE, M.D.

HYDROTHERAPEUTICS, OR THE GENERAL PRINCIPLES OF
WATER TREATMENT.

HYDROTHERAPEUTICS, or Hydrotherapy, is that branch of medicine which relates to the treatment of disease by the internal and external application of water, either in the ordinary liquid form, in the form of vapour, or in the solid form, as ice or snow.

It is an open question as to whether the internal or the external use of waters in the treatment of disease was the first adopted by man. I am, myself, inclined to think that the external use as baths is the most ancient practice. The instinctive habits of animals, and also of man in all stages of civilization, has been to seek the cooling and soothing influence of water applied to the external surface of the body in both local and general forms of disease, and we can conceive that primitive man would regard the internal use of simple water merely in the light of food, and not as a medicine. As for mineral springs, to him, their unnatural qualities of taste or smell would most likely deter him from drinking them. But however this may have been in the earliest history of water treatment, there can be no doubt that its external application, either in the form of simple baths or of mineral water baths, now forms the major part of the practice of hydrotherapy.

The marvellous results which have followed the treatment of ailments by baths in modern times is often incapable of scientific explanation ; but whilst we may rejoice in our deliverance from mere blind empiricism, yet, nevertheless, we should not forget that the first practical application of baths dates back centuries before science came in to explain their action, even to days when experience was the sole teacher, oftentimes leading men wrong it is true, but sometimes directing them aright.

Why the use of baths and waters was so slow in making headway, and why, even now, many physicians view the subject suspiciously, would form matter for interesting investigation. Braun says :—" There seem to be two different causes—in the first place the want of a just or sufficient idea of the production of animal heat, and, secondly, the want of a strong incitement shattering old prejudices which, from the indolence of habit could only come from without. Just as the errors of homœopathy freed medical science from the dead weight of the misuse of drugs, by proving that not every acute disease requires a specific mode of treatment, so the revolution of the peasant Priessnitz was needed in order at length to bring to honour a century's experience of the effects of cold water in acute diseases, and to assert its value also in chronic illness ; and not until then was the incitement given to admit also the elementary effect of warm water within the sphere of scientific and practical observations."

There is a popular fallacy, which prevails very widely, to the effect that, as a rule, baths can be used with impunity, and without much risk. This is a great mistake. Whether a bath be taken as a mere luxury or as a hygienic preservative, or it be taken for the relief of disease, it is equally important that due care should be exercised in its use. There is many a man who takes his morning bath, or his Turkish bath, improperly, and, from want of proper knowledge, incurs, it may be, serious injury to his constitution, when he is all the time flattering himself that he is preserving his health whilst in the enjoyment of a luxury ; and much greater risk is there when invalids, on their own responsibility, or at the instigation of ignorant or unqualified persons, make use of baths in the treatment of disease. It cannot be emphasised too strongly that it is necessary to apply to the use of baths the same principles which regulate the use of other remedial agents. It should never be forgotten that baths follow the law as to the action of all remedies for the relief of disease. They must be prescribed and dispensed according to certain rules which should regulate the treatment of every case according to its individual merits.

THE PHYSIOLOGICAL ACTION OF SIMPLE WATER BATHS.

Before describing the various baths and bath-processes in detail, it is necessary to discuss the physiological effects of water when applied to the surface of the body. These influences are chiefly of the nature of thermal stimuli, and differ according to the varying temperatures at which the water is applied, and also according to the form of application, as by full immersion of the body, by local immersions, douches, watery vapour, and so forth.

The human body is more susceptible to the influence of such applications than are the bodies of lower animals, a difference due to the absence of a natural protective covering in the case of man. It is this susceptibility which is the cause of a special "reaction" always observed in some degree when water is applied to the human body at temperatures either above or below its own. These various applications operate as cutaneous stimuli, exerting, primarily, a vaso-motor influence upon the capillary circulation of the surface of the body, and these are followed by local and distant reflex phenomena of the most striking and varied character.

It is the custom to speak of "cold" and "heat" as though the terms related to two distinct forces or entities, whereas they refer merely to relative strengths or intensities of only one force, viz., caloric. In using the term "hot" in connection with the body we mean an intensity of caloric in excess of its normal temperature. Now it is in this sense we speak of cold, warm, and hot baths, and in discussing their physiological effects on the human organism, I propose to consider their effects upon (1) the brain and nervous system; (2) the heart and circulation; (3) respiration; (4) the temperature of the body; (5) secretion and excretion. By a systematic arrangement of this kind, I hope to supply a clearer and more correct conception of this part of my subject than is generally to be found in works upon balneology. Before doing so, however, I desire to say a few words about the thermal conductivity of animal tissues, a subject of special interest in connection with the science of balneology, but one which has not received much attention at the hands of investigators.

It is chiefly due to the layer of fat beneath the skin that the heat of the human body is conserved, and its conduction from internal organs is prevented. And as heat is thus prevented from being conducted out of the body, so the various degrees of caloric are, in large measure prevented from entering into the body.

Greiss has investigated the thermal conductivity of various animal tissues, such as the skin, bladder, hoof, horn, and bones of an ox, and the stomach of a sheep. By heating one part of the tissue and placing thereon pieces of wax, he came to the conclusion that fibrous tissues conducted heat more readily in the direction of their fibres than at right angles to their course. He arrived at this result by observing when, and in which direction, the pieces of wax commenced to melt. This opinion is supported by Landois, who found that tissues conducted heat best in the direction of their fibres. Next to bone, blood-clot is the best conductor. Bloodless skin is a bad conductor compared with skin containing vessels filled with blood, consequently, the former gives off little heat, whilst the latter gives off freely, and proves a good conductor of heat. We now come to consider the physiological effects of

THE COLD BATH.

(1) *On the brain and nervous system.*—The first effect of the application of cold water to the surface of the body is a general sensation of cold, and if the whole body be suddenly immersed the breathing is momentarily stopped, to be followed by several deep inspirations; the subject shivers violently, the unstripped muscle fibres of the skin contract, causing the characteristic appearance of "goose-skin," whilst the cutaneous blood-vessels are also contracted, producing temporary pallor of the surface of the body. These effects are immediately replaced by "reaction," the skin becoming reddened and a sensation of glowing warmth and comfort returns. From this it is evident that cold water primarily exerts a stimulating influence upon the sensory nerves. Furthermore, the vascular contraction affecting the superficial blood-vessels, causes a

temporary hyperæmia of the deeper viscera, including the brain and spinal cord, resulting in nervous exaltation, and a general sense of invigoration and alertness. The exact nerve channels which are concerned in bringing about the various phenomena excited by cold bathing are not known, but the effects are undoubtedly reflex, and are brought about by stimulation of the peripheral ends of the cutaneous nerves. How profound and powerful are the effects of cold baths upon the nervous system will be most evident when we come to consider the effects upon the circulation and temperature of the body. It must be added that, although the primary effects of the cold bath are stimulating and tonic, if the bath be long continued it then acts as a direct depressant.

(2) *On the heart and circulation.*—During a cold bath the heart beats slower and the general blood pressure is lowered. Vaso-contraction of the superficial blood-vessels takes place in the early stage of the bath, and there is a corresponding dilatation of the deeper blood-vessels and hyperæmia of the viscera and internal parts of the body. If the subject is in a fairly healthy state, and the cold bath be of short duration, a speedy “reaction” follows, the superficial vessels recover themselves, and, indeed, experience some amount of dilatation, as is evidenced by redness of the skin; at the same time the hyperæmia of internal parts passes off, and a general recovery of vascular tone results.

Winternitz has shown that by immersing a portion of the body in cold water, as in the form of a sitz bath, the volume of the arm, as registered by the phthysmograph, is increased, which proves that such a bath increases the volume of blood in the upper part of the body. Dr. George Oliver states that immersion in plain water at a temperature below 90° F., produces contraction of the systemic arteries within three minutes, the amount of this contraction being proportionate to the reduction of temperature. Thus, in a subject, aged 22 years a radial calibre of 2·2 mm., was reduced to 2·0 mm. by a bath at 80° Fahr., to 1·7 mm. by a bath at 70° F., to 1·5 mm. by a bath at 60° F., to 1·4 mm. by a bath at 50° F., to 1·3 mm. by a bath at 40° F. These experiments are instructive as showing that the

vaso-motor influences of the bath are not confined to the capillary circulation, but extend to the vessels of deeper structures. If the body be immersed in cold water for any extreme length of time, say exceeding twelve hours, and when paralysis of muscles and nerves occurs, many of the blood corpuscles are destroyed and coagulation of the blood takes place.

(3) *Effects on the respiration.*—The action of a cold bath upon respiration is at first to cause deeper and quicker inspirations, but this is quickly followed by a slowing of the respiratory movements. The respirations become not only less frequent but more shallow. If carried to extreme limits signs of asphyxia appear, and death may result from suffocation with or without spasms.

(4) *Effects on the temperature of the body.*—The first effect, if any, according to Liebermeister, is to cause a slight rise in the temperature of the body, and when this takes place it is due to the stimulation of the skin which by reflex influence causes more rapid metabolism within the body, and consequently a large production of heat, whilst at the same time the contraction of the cutaneous blood-vessels brings about diminution in the normal amount of heat given off from the surface of the body. Notwithstanding the greater production of heat due to increased metabolism, the continuous application of the cold bath causes a decrease in the bodily temperature, brought about chiefly by conduction of heat from the body to the water.

According to Kernig ("Reichert's Archiv," 1860), a healthy man produces about twice as much heat as he does normally when immersed in a cold bath of 28° to 30° C.; about three times as much in a bath of 24° C., and about four times as much in a bath of 20° C. Weisflog states ("Deutsches Archiv fur Klin Med." ed. ii. p. 570), that the local cooling effects of cold sitz baths cause a rise in the temperature of the axilla, and that in fever patients, unless the sitz baths are prolonged over twenty minutes, there is no fall in the general temperature of the body.

The experimental effects of cold upon the body-heat of animals are extremely interesting, and throw much light on the study of the effects of cold baths upon the human body. If

an animal be cooled down to a temperature of 10° C., and left to itself in a like surrounding temperature, it does not recover itself, but upon the employment of artificial respiration the temperature rises 10° C. If the artificial respiration be combined with the application of external heat, the animals may recover completely, even when they have appeared dead for forty minutes. Thus, Howarth cooled young animals to 5° C., and Walther cooled adult animals to 9° C., and resuscitated them afterwards by the application of warmth and artificial respiration. Birds which come out of the egg without feathers, and mammals which are born blind, cool more quickly than others. Alcohol accelerates the cooling of mammals, and this explains the greater liability of drunken persons to death from exposure to cold.

It must also be noted that the mode of applying the cold bath, even at the same temperature, influences the resulting effects on the temperature of the body. We have already seen that a partial bath, such as the sitz bath, raises the temperature in the axilla, and if the body be placed at once in a bath, the elimination of heat is retarded in consequence of the contraction of the cutaneous blood-vessels. Now if the bath be gradually cooled it is not only borne longer, but the temperature is lowered more quickly. Furthermore, the results may be influenced by the addition of chemical substances to the cold bath such as salts, which causing increased dilatation of the cutaneous circulation accelerates the elimination of heat. So also may this process be facilitated by the administration of alcohol internally.

(5) *On secretion and excretion.*—As in the case of hot baths so in cold baths, the kidneys are stimulated to increased secretion, whilst on the other hand, the action of the sweat glands is retarded and perspiration checked. The vascular contraction of the superficial blood-vessels which accompanies a cold bath and causes temporary hyperæmia of the deeper viscera, is favourable to the increased secretion of bile. Cold baths increase the muscular tone of the intestines, and thus favour regular action and excretion by the bowels.

The experiments carried out upon animals by A. Rohrig

and N. Zuntz, and upon men by Prof. Leibermeister, Dr. L. Gildemeister, and Dr. L. Lehmann, seemed to prove that a large excess of carbonic acid is eliminated from the body both in health and in fever under the influence of cold baths over that given off under normal conditions. In his later experiments upon the elimination of carbonic acid, however, Leibermeister found (*"Deutsche Archiv,"* Bd. x. p. 425), the quantity given off after the cold bath, and for some time afterwards, fell below normal.

THE HOT BATH.

The temperature of hot baths varies from 98° Fahr., to 108° F. The hot bath exerts very powerful effects on the organism, and necessitates extreme care in its application. Its physiological action is approximately the reverse of the cold bath, but it will be convenient to adopt the same order in considering the subject as was followed in connection with the cold bath.

(1) *On the brain and nervous system.*—Although the hot bath acts at first as an excitant this is but transitory, and the general effect is that of a depressant. It produces a distinctly sedative influence on the sensory nerves as is evidenced by the relief of painful parts by hot bathing. If the body be immersed for a long period in a hot bath there is produced general nervous depression, languor, muscular weakness, drowsiness, and ultimately convulsions and coma may result.

The profound vaso-dilatation which affects the more superficial blood-vessels of the body causes a partial emptying of the deeper blood-vessels and a slowing down of the circulation. As a result of this, the internal organs, including the brain and spinal cord, become more or less anæmic.

(2) *On heart and circulation.*—Hot baths accelerate the heart's action. The frequency of its beat being in direct relation to the amount of vaso-dilatation of the superficial blood-vessels. The effects on the general vascular system and circulation are extremely marked. Redness and hyperæmia of the skin is produced owing to dilatation of the superficial vessels. Dr. George Oliver has shown that hot immersion baths of

100° Fahr. to 105° Fahr., quickly reduce the calibre and pressure of the radial artery owing to the rapid dilatation which takes place in the arterioles and cutaneous periphery. This vaso-dilatation causes turgescence and swelling of superficial parts of the body, so that if the volume of a limb be measured immediately after the hot immersion it will be found greatly increased, but this increment speedily subsides, and it therefore differs from the larger and more persistent increment of a limb induced by exercise.

(3) *On respiration.*—The respiration is greatly accelerated as a first effect of hot baths, but the respiratory movements become slower if the bath is continued. Nevertheless, increased respiration continues so long as the vaso-dilatation renders such respiratory aid necessary.

(4) *On the temperature of the body.*—The effects of hot baths, like those of cold baths, on the temperature of the body are remarkable and interesting. The first effects are really cooling effects, and more heat is radiated from the body during the bathing process than under ordinary conditions. This is necessary, otherwise the temperature of the hot bath would increase the normal temperature of the body. To effect this compensation the superficial vascular dilatation, with its increased secretion of sweat, and the accelerated respiration, with its increased excretion of the products of combustion and watery vapour, all contribute their share. It would also appear that the heat-producing mechanism of the body is slowed down so that the compensatory elimination of heat is rendered more easy and certain.

From experiments upon guinea pigs, conducted by D. Finckler, it has been shown that the production of heat was more than doubled when the surrounding temperature was diminished 24° C. The metabolism of the guinea pig is increased 23 per cent. in winter as compared with summer, thus showing the same relation to exist as in the case of a diminution of the surrounding temperature during a short period of time. From this we may assume that a converse action takes place when the body is immersed in a hot bath consisting either of water, vapour, or air.

(5) *On secretion and excretion.*—The kidneys are stimulated to increased secretion ; as also are the salivary glands sometimes. The sudorific glands become more active and sweat is poured out in increased quantity. There is no very trustworthy evidence as to the physiological influence of hot baths on the secretion of the liver. According to Pflugar, when animals are placed in a hot bath at a higher temperature than that of their own bodies, the excretion of carbonic acid from the lungs is increased owing to stimulation of their metabolism. There is also increased excretion of watery vapour from the lungs as we have already seen. With the augmented secretion of urine there is increased excretion of urea and uric acid. Hot baths increase the intestinal secretion, but lower the muscular tone of the bowels, and thus favour constipation.

I may here mention that partial hot bathing of one part of the body will sometimes produce a sweating effect upon another part. Thus one leg or one arm immersed in hot water, hot air, or hot vapour, not infrequently causes sweating of the corresponding limb or even of the whole surface.

OCEAN BATHING.

BY PHILIP MARVEL, M.D.

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SEA or ocean bathing is in no wise a novel subject. History informs us of its practice by the ancients, as well as by the early savage tribes. It has been an indulgence of all nations since the earliest periods of history, either as a religious ceremony, a bodily necessity in affording cleanliness, a means of restoring health, or a pleasurable pastime.

Melampus, a Grecian physician, who lived about one hundred and fifty years previous to the era of the Argonautic expedition, is said to have cured the daughter of Pratus, King of Argus, of a malady, which hitherto had resisted all remedial agencies, by the daily use of the cold bath and the internal administration of ferric oxide, the latter being obtained by exposing iron ore in a small vessel of water. As a fitting reward for his superior knowledge and skill he is said to have received the hand of his fair patient in marriage and, in addition, one-half of her father's kingdom.

The foregoing is interesting from two standpoints, namely, first, so far as is known it is the first record of the administration of a mineral remedy for the cure of a disease, and second, it prescribed a treatment for anæmia, various nervous and functional disorders which the past ages have but slightly changed, forming a part of the rational treatment recommended to-day. Whether the application of cold baths, with or without the assistance of a mineral remedy, have in any subsequent cases been attended with such decidedly beneficial effects, or the author of a treatment has ever been remunerated with such a munificent gift, I must leave an open question. But that bathing, both general and special, has been from time to time subject to the vicissitudes of numerous opinions and practices may be stated without further reference.

Galen seems to have been among the first of authorities to raise his voice against the excesses which are said to have

occurred in the early history of excessive bathing, and he especially denounced the use of cold baths as "pernicious and only fit for barbarians"; but even the denouncement of one so great and renowned as Galen was not heeded; the people continued the practice of ocean and pool bathing as had the earlier generations.

Tradition brought from one generation to another the early beliefs and implanted into the minds of the people the favourable benefits to be derived from so accessible a remedy. The Romans especially, and other contemporary nations, are known to have expended enormous sums of money in fitting up establishments or bathing palaces, the ruins of which remain to-day, not alone an interesting monument of their extravagances, but also as evidence of their great belief in the efficacy of the bath.

I have been unable to fix by history the exact date of the beginning of ocean or sea bathing, but many references tend to show its great antiquity and that at one time it was almost universally resorted to for the cure of bodily ills.

Both the Indians and the early settlers of our country are known to have made frequent pilgrimages to the great sea, as well as to the mysterious springs, for periodical ablutions, having the assurance of their wonderful healing powers. But as time has gone on we have to some extent lost faith in the all-sufficiency of the bath; however, simultaneous with this loss of faith as a remedy for a health restorative we have encouraged its indulgence as a pleasurable pastime, and in some instances the latter feature has so overshadowed the former that frequent and continued exposure has brought the sad experience of serious disturbances.

In considering the advantages *versus* the disadvantages of sea bathing we must not lose sight of the fact that it is impossible to separate it from the influences of the other agencies, such as temperature and the physical conditions of the atmosphere. And, again, it is no less true that the physical and mental condition of the individual at the time of the bath may greatly modify or influence the effect; hence the question must be studied from a standpoint at once

complex in itself. Sea water being composed of minerals, such as chloride of sodium, magnesium, bromine, and iodine, is truly a mineral water, and an ocean bath, therefore, may properly be classified as a mineral bath. Since temperature is one of the agencies in the bath to be considered, we must regard the presence or absence of heat other than a positive quantity of either the water or the body. In Nature's operations heat and cold are as necessary as they are wonderful, whether contemplated from their effect upon the human body, upon animal life in general, or upon inanimate matter. In the human body heat and cold answer only a relative action, and by this relative action so much depends upon the particular state and condition of the body at the time and the end to be subserved. They may be alike : first, salutary, and second, pernicious. I have observed those who for different reasons have been obliged to remain for hours submerged in the sea, and have noted both the slowing off and the enfeeblement of the pulse, the lowering of the temperature, and the evidence of general debility as exhibited by the loss to the various forces. I have also observed with equal interest those immersed for a time in warm water at a temperature higher than that of the body. Here the first influence was that of the speeding of the blood current, the stimulation and invigoration of the motor centres, the increasing of the cellular and glandular activities, and, as the exposure was prolonged, secondarily, the depressing influences became so marked as to completely derange the equanimity between the capillary and larger circulations, limiting nerve force, and thereby lowering the systemic resistance to a greater or less degree. In the former—*i.e.*, exposure to cold sea water—I have noticed the temperature lowered from 1° to 2° , and at the same time the lessening of the pulse rate from fifteen to twenty beats.

Dr. Gibbony, an English authority, referring to the subject, states that in his observation "of flounder fishermen off the coast of Northern Ireland, and of the shrimp fishermen off the coast of Brighton, England, where their vocation compels them to be exposed in the water for many hours," the temperature of these waters being at least 10° lower than that of

the Atlantic Ocean along our coast, he has noted the pulse as many as thirty beats less than normal, and the temperature reduced $2\frac{1}{4}^{\circ}$.

Hippocrates once advanced the theory "that the subsequent heat succeeding to the cold applied was always proportionate to the intensity of the latter." While this may be to some extent concurred in, it is subject, both in health and in disease, to special modifications, which modifications arise more particularly from the length of time of the exposure and the conditions under which the exposure is made. Therefore, when considering the special benefits or the special diseases and conditions to be benefited, there are other agencies or influences which must be taken into account, such as, for instance, those relative to the sea, namely, the forcible activity or movement of the water; the physical conditions of the strand; the distance and convenience of the dressing rooms, and those relating to the individual, namely, the resisting power of the body; the time of the bath; length of time of exposure; the temperament; the physical debility present, *i.e.*, whether the body is relaxed, enervated, nervous, or highly tensioned, and also whether the result to be obtained should be bracing, tonic, stimulating, and invigorating—in other words, the individual bather must be considered a complexity of forces or an aggregation of systems capable of independent as well as allied actions.

Beginning with a simple cell, with its inherent power, we can easily follow the force suggested until it expands into the various systems, chief of which are the nervous, the vascular, the glandular, and the muscular, each of which is easily influenced individually and collectively, incidentally and relatively, internally and externally.

Time does not permit of a further discussion upon this part of the subject. I therefore leave it with these mere allusions; but your own familiarity with the same has already impressed you with the importance of a subject so universally used, yet so thoughtlessly and slightly considered.

Just here it may not be out of place for the sake of illustration to consider the human body as a type of a perfect

machine, constructed in a beautiful and wonderful manner, with its functions so intimately poised, accurately organised, and so connected that none other could be more perfect. The deviation from this type must be represented by disease, either functional or organic, while the extent of the derangement represents only the degree.

Assuming this to be our perfect machine, our type necessarily will be a youth representing vigour and perfect development. In the immersion of such an individual in sea water at a temperature of 65° to 70° we would naturally find a quick response to the sudden stimulation of cold, that is, of the water, which meets the surface of the body as the plunge is taken. The stimulus to the peripheral sensory nervous system is such that it quickly contracts the adjacent capillaries and sends the blood speeding to the larger vessels and internal organs. The systemic vigour and reserve forces return it again to the surface of the body, accompanied by the resiliency and invigoration which emphasises the pleasurable sensations so gratifying to the bather.

If, after dressing, from such a bath a genial glow suffuses itself over the sensitive surface of the body, a pleasing warmth internally succeeds, accompanied by a refreshed and invigorated feeling, it is evidence and proof of the salutary influences; but if, instead, there follow a chilliness, languor, headache, irresistible depression and disposition to drowsiness, or any of these, it should be reckoned as important evidence establishing the fact that the bath has not contributed in any material way to the advantage or improvement of the person's health, and that, if persisted in under similar or like conditions, the result will in time prove injurious. So much depends upon the vital power or reactory influences, which we may call the *callidum innatum*, which is constantly renewed by a most admirable combination of chemical agencies and animal functions, that, after considering the preliminary conditions previously stated, it becomes equally important for us to observe our patients—that is, the influence succeeding the baths—and impress upon them the necessity of looking for the special reaction above stated, and when it is

absent, to desist further indulgence in so questionable a pleasure.

With these generalities and allusions, I now come to speak more specifically of the use of the bath and the special conditions and diseases for which it may be used. In the first place I venture to make the statement that the sea or ocean bath as practised in our city and other Atlantic seacoast resorts is responsible for greater harm than good. Few people seem to attach much importance to the danger of either the prolonged exposure in the water or to the prolonged exposure in their wet garments in the cool atmosphere on the sand. While this seems a matter of easy remedy, particularly if a little good judgment and common-sense be exercised ; nevertheless, the surprise is that the practice increases rather than diminishes. It may be said in advocacy of such a practice that the majority of bathers bathe for pleasure, with a blind disregard for either its advantages or disadvantages, and indulge themselves to such periods of time as either their own or their friends' conveniences permit. Admitting the truth of this claim, there does not yet seem to be any good reason why the seeking of pleasure should be an apology for the violation of the laws of health ; and too often the physical condition present, which already may have given them great concern, adds no alarm to the occasion. Many of us have stood by the strand and observed not a few but many, of all ages, young, middle aged, and old, alike, returning from the surf, or from a prolonged exposure in their wet clothing on the sand, to their dressing-rooms, slightly and even markedly cyanosed, with pale and shrivelled cutaneous surfaces, arterial capillaries contracted, cutaneous functions temporarily paralysed, internal organs and deeper vascular system greatly engorged, and in some instances seriously disturbed, shivering and chattering as they pass, giving little thought to the threatening dangers incidental to the impaired forces and debility occasioned by the exposure.

In view of these observations, it would seem that our voices have already been too long still and our pens too inactive on the subject so universally abused. Each physician should counsel those over whom he has advisory charge, of the

dangers incident to a prolonged exposure in the ocean or on the sand in wet clothing, and also to the too frequent daily indulgence of either. It is his duty to impress upon them the advantages of a short exposure or immersion, say ten, fifteen, or twenty minutes, and never exceeding thirty minutes ; the necessity of prompt and positive reaction after the bath ; the maintaining of a good physical condition, and giving to them, according to their own particular debility, such specific instruction as will best avert harmful or serious disturbances. When the normal bodily temperature is exposed to that of an active body of water, or currents of air 10° , 30° , or 40° lower than itself, the tendency is to the equalisation of the temperature of the bodies in contact, and the greater the motion of the bodies the more rapid the transfer and the more rapid the receipt and loss to the bodies involved ; hence prolonged contact largely reduces the former, while it adds but little to the latter. The body during this large dissipation of heat becomes so enfeebled that its economic forces are temporarily inhibited and, in some instances, seriously deranged. While such general disturbances may be frequently observed in the healthy and normally robust, it much more frequently occurs in those of less resistance, therefore the necessity for greater precaution in giving advice and making recommendations to those whose health has already suffered impairment.

The practice of promenading the beach in the scant and poorly protecting garments, so fashionable of recent years—I pause to emphasise the word “fashionable”—after an immersion from, say, three-quarters to an hour in the surf, is unmistakably harmful and equally inexcusable, and should have the denunciation of every physician as well as others engaged in the upbuilding and maintenance of good health ; and there is little less to be said in favour of the practice of lying on the sand and frequently returning to the water, which practice so changes the temperature of the body as to invite lowering resistance, and thus rapidly insures progressive debility.

An important feature in sea bathing which must not be lost sight of is the active motion of the water, *i.e.*, the impact

of the swells or waves; to this may be added the thermic stimulation of the cold, the chemical irritation of the salt, and the mechanical influence of the fenced activity, thus giving a marked nerve stimulation and an energetic primary vascular contraction and subsequent reaction. Hence, when summarily considered, we must recognise that a tremendous impetus is given the fluids of the body, an incidental active alteration in the various forces, also modifications direct and indirect to the reflex activities. The cold sea bath combines the stimulating influences of the brine bath at a low temperature, with the effect of a stimulating hydrotherapy procedure. They are *admirable for rapid reaction* and prompt functional stimulation, and are indicated in those weakened conditions where normal metabolism is inhibited or perverted nutrition exists. Such conditions are present usually in all functional disturbances of some standing, a type of which is neurotic dyspepsias; anæmias; functional neuralgias; neurasthenia; some cutaneous diseases, as eczema in subacute and chronic form, &c.

Sea bathing is contraindicated in those cases in which the arterial elasticity for any reason has been changed or lost, as in arterio-sclerosis and capillary fibroses; and when the peripheral vessels have ceased to respond to reflex stimuli, or in any case or condition when the stimulation of the bath would be likely to favour or produce internal hæmorrhage, particularly in the aged, in whom we have realised or suspected fragile arteries, and for those with organic heart disease, recent rheumatism, cholelithiasis, or any acute gastrointestinal or febrile diseases.

THE MECHANICAL TREATMENT OF ORGANIC HEART DISEASE.

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IN 1892 I had the honour of presenting to this Association, upon the occasion of my election to membership, a demonstration of the relations of pneumatic differentiation to the several forms of pulmonary disease. In the fall of that year circumstances led to a thorough consideration of the cabinet forces in special relation to the pathic conditions of cardiac disease, which resulted in a convincing demonstration that in pneumatic differentiation we have the nearest approach to an ideal treatment of organic heart disease at present known to medical science. It is an abstract of that demonstration which I desire to present to you at this time, in brief outline and familiar form, reserving the right to fall back upon an article published in the *Journal of the American Medical Association* of March 15, 1902, for technical accuracy of statement under criticism.

This demonstration is based upon the following fundamental propositions :—

(1) The first pathic effect of every cardiac lesion is either weakening of muscular power or an increase of blood tension in some one, and decrease in an associated vascular cavity.

(2) The ultimate destructive effect of all cardiac lesions is the development of a vascular tension in excess of the compensating muscular power, whether it be attended by increase or decrease of both, or by increase of one and decrease of the other. Whatever the line of change, death comes through a disturbance in this ratio between tension and power.

(3) The results of this change are : slowing of circulation, with consequent tissue malnutrition ; hence reflex arterial contraction to hasten circulation, with consequent increase of the already pathic tension and a resultant augmented strain

of the circulatory organs, whereby the circle of mutually causative lesions is made complete, that eventually results in tissue degeneration and death. Or, in very simple terms, defective power and excessive tension are the factors of death in cardiac disease.

(4) In view of these physical facts, and our present inability to repair cardiac lesions, the ideal treatment of organic cardiac disease is found in that agent which will supply circulatory force and reduce vascular tension in such degree as will allow the nutritive repair to keep pace with force demands. That is, that will carry on the circulation for the heart and relieve the destructive tissue strain while the heart rests and recuperates. It can be and has been absolutely demonstrated by physical methods that this is precisely what is accomplished by pneumatic differentiation, and the demonstration 'backed up by clinical results of many years' duration.

The physics of pneumatic differentiation and the relations of its forces to pathic cardiac conditions will, perhaps, be more clearly and readily understood if we consider their application to a specific lesion; and I choose aortic insufficiency as the one which is the most disheartening under ordinary methods of treatment, but to which pneumatic differentiation is most perfectly applicable.

Given an aortic reflux and the pathic effects and results are, in order, as follows: increase of ventricular and decrease of arterial diastolic pressure—results, ventricular stretching and eccentric hypertrophy; slowing of circulation and consequent reflex arterial contraction to restore tension—secondary results, increase of aortic reflux, hypertrophy, and a repetition of the same vicious circle of changes. This process continues, maintaining a reasonable circulation, until the systolic arterial and the diastolic ventricular tension reach a point where tissue nutrition fails; the ventricle and arteries continue to stretch, but not to hypertrophy, and at this point begins the systematic march to the grave.

In what way, now, is pneumatic differentiation applicable for the relief of these conditions when present; for their arrest or prevention when developing or foreseen? In considering

the demonstration which I have to offer, I beg that you will keep carefully in mind the fact that the break in the conditions outlined came, as it does in all cardiac disease, at the point where vascular tension was in excess of possible force expenditure on the part of the ventricle, and that, therefore, a reduction of diastolic tension with an increase of propulsive force means restoration of circulatory equilibrium.

I say it with shame, for it seems to reflect upon my powers of exposition, yet I say it for the sake of truth, that I have yet to find a dozen physicians who seem to appreciate what is meant by a pneumatic differentiation. The pneumatic cabinet seems to stand simply as the equivalent of altitude, and its action as merely the taking off of pressure. I am not surprised that it seems a very unimportant affair to those whose knowledge is thus limited and inaccurate. If that were their only action, cabinets should not sell for over a dollar a dozen. Let me try once more to show what is meant by pneumatic differentiation; what its effects are upon the circulation, and, therefore, what its therapeutic value is, not only in cardiac but many other conditions. Pneumatic differentiation means a differential atmospheric pressure; a different pressure on the pulmonary circulation from that on the general circulation. As applied in the pneumatic cabinet it means the development of such a differential pressure in favour of the general circulation during inspiration, and the reversal of this differential in favour of the pulmonary circulation during expiration—that is, the pressure on the skin is less than that on the lung during inspiration, and less on the lung than skin during expiration. All of which amounts to this, that an atmospheric suction force is applied to the skin during one-half of respiration and to the lungs during the other half. It is accomplished in this way: A patient is placed in the cabinet and his lungs connected with the outside air by a tube. It is evident that if, as he inspires, the air of the cabinet is rarefied his pulmonary circulation will be under barometric pressure, and the general circulation under a lower pressure, and that this is the equivalent of having the entire systemic circulation under one huge dry cup. The effect upon this circulation is identical, in character

with the local effect of a dry cup ; the capillaries are dilated, the blood flows more easily and is sucked out of the arteries into the veins, with the effect of reducing the diastolic tension primarily ; the force which, as we have seen, is the determining factor of the reflux, and hence of evil in the case under consideration. Here, then, at the outset, is the specified ideal measure which reduces tension actually and force relatively.

Now, if these conditions of differential pressure were to be made permanent, the effects would again be the same in character and equally injurious as when a dry cup is allowed to remain in action over a few seconds ; the capillaries would become engorged, the arteries would contract in response to the lowered tension, and very soon the previous conditions of tension would be restored, with an engorged venous system and a slowed circulation. But if, on the contrary, this differential be held only during a slow, quiet, deep inspiration, and for a second or two after its completion, the effect is merely a mild arterial depletion with equivalent reduction of diastolic and systolic tension and simple venous fulness. At this point the patient drops the tube from his mouth, and instantly his pulmonary pressure drops from barometric to that in the cabinet—say, one pound to the square inch. It is just here that so many fail to follow the demonstration, and are unable to see how conditions of equal atmospheric pressure on both the pulmonary and general circulations are equivalent to a differential in favour of the lung. The explanation is to be found in the fact that the vascular effects of a general reduction of atmospheric pressure are greater in the pulmonary circulation by reason of its relatively weaker anatomical supports. Everyone knows that a reduction of several inches of mercury in the general pressure, such as is found at elevations of ten thousand to twelve thousand feet, will draw the blood from the brain and cord and the cutaneous surface and cause extreme pulmonary hyperæmia, even to the point, at times, of causing vascular rupture. Yet, although this pulmonary suction effect of reduced pressures is clearly recognised in the extreme, the absolutely identical action of rarefactions of one and two inches of mercury is ignored and denied

solely because its milder degree does not result in obtrusive symptoms. That it is present, however, in cabinet action cannot be questioned, for it can be made grossly evident to the eye. Hence, as the patient in the cabinet at the end of his full inspiration, with depleted arteries and full venous system, drops the tube from his mouth, the atmospheric differential is instantly reversed in favour of the lung, and the blood is drawn from the veins under low tension into the pulmonary vessels until they, in turn, become mildly hyperæmic. Thus the differential and circulatory cycle is complete; the blood has been hastened in its flow; diastolic and systolic arterial tension have been reduced; the aortic reflux has been diminished, and the demand upon the ventricles for force expenditure has been lessened; while the heart muscle, freed from overstrain, has had opportunity to contract fully and regain its tonicity. In other words, the ideal relief has been afforded a crippled and overtaxed heart, and there is no therapeutic measure in the whole realm of medicine which gives more brilliant results than does pneumatic differentiation in aortic reflux. No patient suffering from that lesion can take a dozen such breaths and not be conscious of relief. But, to continue the process a step further and begin a second respiratory cycle. We left the patient in the rarefied air of the cabinet with vascular conditions, those of mild pulmonary hyperæmia. This is never sufficient, under the rarefactions employed, to cause any conscious increase of dyspnœa, even when that is severe. It is to be observed also that the rarefaction is still acting upon the systemic vessels, as well as the pulmonary, whereby reduction of arterial tension is held constant, even if less than during the differential conditions of inspiration. But the patient remains thus only long enough to take a full inspiration from the rarefied air of the cabinet, giving time for the full effect of the pulmonary differentiation, and then again takes the breathing tube in his mouth. As the cock is opened and barometric pressure restored to the lung, the original differential relations are again established, and the lungs are again depleted by suction of the blood into and through the heart and vessels to the

veins. It is to be noted that this restoration of pulmonary pressure is only barometric, and hence does not throw any strain upon the right heart; it is a compression in a sense, but only normal, and yet greater than that upon the systemic vessels. Moreover, this relatively higher pressure is applied through the lungs to the outside of the heart, so that the right heart has support equal to the pressure on the circulation which it carries, while the left heart is practically compressed compared with its circulation. This differential pressure is such that the blood is practically sucked out of the left heart without muscular effort. Indeed, it is possible at times to demonstrate by the sphygmograph a total abolition of diastolic tension by this process, with an augmented blood flow—the conditions previously defined as representing the ideal therapeutic results.

The relations of this process to other forms of heart disease are readily deduced from the foregoing. In mitral regurgitation the effect is often as immediate and definite, but less in degree and duration, since the extent and permanency of results must depend upon the compensating tissue. In mitral reflux this is essentially the lungs, in which resistance cannot be developed as in the ventricle.

My experience with aortic obstruction has been almost entirely in elderly patients, where the lesion was part of the changes of age. In this class of patients the results almost equal those in aortic reflux. With mitral obstruction something may be done to afford relief by one who is perfectly familiar with the cabinet, but a novice will do well to leave this lesion alone. It requires a different form of differentiation from that detailed above. In cases of angina, however, whether from changes in the coronary or systemic vessels, and in all forms of myocardial degeneration and weakness, the cabinet is *facile princeps* in the rapidity and permanency of the relief afforded.

Some of those critics who “speak before they think” have uttered most impressive warnings against the danger of producing rupture and paralysis in cases of arterial degeneration. There is no such danger, however; for rupture, should it

occur, could only be in a peripheral, not a cerebral, vessel ; since the brain and cord are so protected by their bony envelope that pneumatic differentiation produces cerebral anæmia, not hyperæmia. Indeed, this effect is at times, with anæmic patients, a hindrance to the application of the treatment for the relief of the cardiac and circulatory disturbances of old age, for which it is otherwise invaluable. It has not been my fortune to find anything which can compare with the cabinet for the relief of the weariness, nocturnal wakefulness, and afternoon sleepiness, so characteristic of the cardiac failure of advancing years. It is not claimed, of course, that pneumatic differentiation has any effect upon the arterial changes once developed, but simply that when the circulation is slowed and the heart weakened by reason of such changes, the cabinet affords more relief than any other measure at our command, by reason of its control of the circulation. The arterial tension of chronic renal diseases is, in the earlier stages at least, largely due to arterial spasm, developed for the purpose of hastening circulation, and is very definitely relieved in many cases by the improved nutrition and excretion that are among the results of pneumatic treatment.

I have not burdened this paper with the clinical evidence of reported cases, as that can be found in the paper referred to earlier. I desire this paper to stand upon the basis of the physical demonstration and personal authority.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

THE First General Meeting, followed by an Ordinary Meeting, was held at 20, Hanover Square, London, on Thursday, October 29, 1904. Dr. ALFRED STREET (Westgate-on-Sea), and subsequently Dr. BOWEN DAVIES (Llandrindod Wells) in the chair.

GENERAL MEETING.

The PRESIDENT said the Fellows were probably aware that the President of the Council, Dr. Snow, was prevented from being present by an engagement at the College of Physicians.

TREASURER'S REPORT AND BALANCE SHEET.

Dr. SOLLY (in the absence of Dr. Harry Campbell, the Treasurer) read the Treasurer's Report and Balance Sheet, and moved their adoption.

Dr. HEALEY (Blackpool) seconded, and it was carried unanimously.

INTRODUCTION OF THE NEW PRESIDENT.

The PRESIDENT (Dr. Street) said it now became his duty to introduce to the Society its new President, Dr. Bowen Davies, of Llandrindod Wells, and in doing so he wished to thank the Fellows for the very kind way in which they received him twelve months ago, and for the uniform kindness which he had received since. He took the Chair with considerable misgivings, and he did not say he was altogether sorry to relinquish the responsibilities of it. At the same time, he could honestly assure the President-Elect that if he experienced anything like the kindness that he (Dr. Street) had on all hands during his year of office, he was to be envied rather than pitied.

Dr. BOWEN DAVIES then took the Chair, and thanked the Fellows for electing him to the position of President, of which he was very proud. His first duty was to ask for a vote of thanks to Dr. Street for his services in the Chair during the year just terminated, which had pleased everyone.

Dr. GROVES (Carisbrooke) said he had great pleasure in

proposing a vote of thanks to the President for the ability he had displayed during his year of office. It was most difficult to speak of a man's good qualities to his face. He would rather tell a man of qualities which did not adorn him than flatter him in his presence. However, all were so thoroughly agreed that it was unnecessary for him to say much. Dr. Street had conducted the business of the Chair with the greatest possible dignity, ability, geniality, and courtesy, and it was with great pleasure he proposed the resolution.

Dr. HAMILTON CUMMING (Torquay), in seconding the vote, said all would agree that Dr. Street, by his urbanity and tact, had done a great deal to make the meetings of the past year pleasant, and it was quite clear that he had the welfare of the Society at heart.

Dr. STREET, in returning thanks, said that if anything could have added to the sense of gratitude under which he laboured it would have been the kind words which had fallen from the last speakers. He did not deserve half the words which had been spoken of him, but perhaps in privacy Dr. Groves would kindly paint the other side of the picture.

THANKS TO THE TREASURER AND AUDITORS.

Dr. DOUGLAS KERR said it was his pleasant duty to propose a vote of thanks to what he might call the permanent officials of the Society. Even Presidents came and went, but the gentlemen who were the objects of the present vote continued in office year after year. On the way the Treasurer looked after the funds the very life of the Society depended, and he had pleasure in proposing that the thanks of the Fellows be given to the Treasurer, Dr. Harry Campbell, and the Auditors, Dr. Carpenter and Dr. Achard.

Dr. NIGHTINGALE seconded, and it was carried unanimously.

Dr. SOLLY (in the absence of Dr. Harry Campbell) acknowledged the vote.

THANKS TO THE EDITORS.

Dr. SYMES THOMPSON, in proposing a vote of thanks to the Editors, said the success of the Society depended largely upon the way in which the editorial work was done. Many

members lived far away, and though some came to the meetings from a distance, many did not, and they were able, by means of the Transactions, to enter into the Society's work. It was, he thought, impossible to read the Transactions without realising that the Editors were extremely efficient men, because the Journal was always so fresh and full of life and interest. By that means the enthusiasm felt at the meetings was carried far and wide, so that the Society owed a deep debt of gratitude to Dr. Leonard Williams and Dr. Sunderland.

Dr. SOLLY, in seconding the motion, expressed the regret he felt that neither of the gentlemen were present. The Society was indeed very grateful to them, but he would point out that the Journal might be looked upon as the great spending department, so that the Editors must certainly be regarded as very important officers.

The resolution was carried unanimously.

THANKS TO THE COUNCIL AND THE HON. SECRETARIES.

Dr. HEALEY (Blackpool), in proposing a vote of thanks to the Council and Secretaries, said he spoke as a Fellow whose connection with the Society was practically only through the medium of the Journal. It was a great comfort to one who lived in an out-of-the-way part of the world to be able to know that there was a Society which brought together all the information on the subjects in which the Fellows were interested, and the views of those Fellows on the different forms of treatment.

Dr. LEON (Southsea) seconded the vote of thanks. Though matters seemed to progress smoothly, he knew that only meant that the work had been efficiently done by the secretaries, and if anyone deserved a vote of thanks in such a Society it was the Honorary Secretaries.

Dr. CLIPPINGDALE, in returning thanks on behalf of the Council, said he was only one of the junior members of it. The work of the Council was done very willingly, but that body relied very much on the Secretaries, to whom the thanks should be given, while any blame might be attributed to the Council.

Dr. SHIRLEY-JONES (Droitwich) responded.

ORDINARY MEETING.

The PRESIDENT read an address on "The Spa Treatment of Arthritis Deformans."

Dr. M. KERR said it was his very pleasing duty to propose a hearty vote of thanks to the President for his very lucid and suggestive paper, in which he had gone very deeply into the subject. He (the speaker) felt somewhat out of the medical world at present, as he had been away a year, and had lost touch with the prevailing views. He feared he differed somewhat from the President's views on some points, but the thanks of the Fellows were due for the light shed by the paper on a difficult subject.

Dr. HEDLEY thought all would agree that the address had been on a most interesting subject. It was much more satisfactory to have personal observation and experiences than pages of abstract theory on such a subject. One felt every reason to be thankful to have listened to an address upon rheumatoid arthritis without once hearing the words "trophoneurosis," or "micro-organism."

DEMONSTRATION OF ELECTRIC LIGHT BATH.

Dr. HEDLEY, in showing a recently-devised modification of the Electric Light Bath, said it was not everyone who bore the electric light well. Some complained of a feeling of giddiness and faintness, presumably the result of the depletion of the internal organs by the extreme activity of the skin. Others in the recumbent position complained of a sense of constriction in the chest, with difficulty of respiration, such as would be caused by their being boxed up. The feeling was nervous, and had to be reckoned with; sometimes it prevented people from taking a recumbent bath. He had, therefore, tried to get over the difficulty by adopting a *viâ media* between the sitting and the horizontal postures. He accordingly asked the maker to look at the lines of a deck-chair, and build a bath round it. He trusted the bath exhibited would answer the purpose as soon as it was complete. The lights used were ordinary incandescent lamps, but any electric light would do.

THE BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

BALANCE SHEET FOR THE SESSION ENDING SEPTEMBER 30, 1904.

RECEIPTS.		PAYMENTS.	
	£ s. d.		£ s. d.
To Balance at Bank Sept. 30, 1903	144 3 3	By Treasurer's Petty Cash to Sept. 30, 1903	2 0 0
Subscriptions received for the year 1903—1904*	156 19 6	Chairman of Council, Petty Cash to Sept. 30, 1903 (Dr. Fox)	1 0 0
as arrears owing prior to Oct. 1, 1903	22 11 6	Secretary's Petty Cash to Sept. 30, 1903	5 12 7
Advertisements in Journal as per A. Viner's Account	50 19 0	Printing (Messrs. Bale & Sons)	51 5 11
Sale of Journal (Bale & Sons)	3 11 10	Cash credited (Messrs. Bale) being monies received by them on account of Sale of Journal	3 11 10
		Miss James, Indexing Journal	1 10 0
		Clerical Work for Treasurer (A. Viner)	5 9 10
		Porter, 20, Hanover Square	1 0 0
		Rent,	25 4 0
		Miss Irwin, for typewriting	1 1 8
		"	0 4 0
		C. Baker, for Lantern Exhibition	1 11 6
		C. Jackson, Medical Directory	0 10 6
		C. Wood, Wreath	0 15 0
		A. Viner's Account, 1/2 Advertisements	6 2 4
		Returned Cheques to Bankers	1 11 6
		Bankers' Charges	0 3 10
		Balance at Bank Sept. 30, 1904	69 10 7
	<u>£378 5 1</u>		<u>£378 5 1</u>
LIABILITIES.		ASSETS.	
	£ s. d.		£ s. d.
To Secretaries' Petty Cash to Sept. 30, 1904	4 3 6	By Subscriptions in arrears Sept. 30, 1904	58 5 6
Treasurers' "	1 10 0	Estimated proportion of Income from Advertisements in Journal, due to Sept. 30, 1904	22 5 0
Rent, 20, Hanover Square	8 8 0	Balance at Bank	69 10 7
Printer, Journal Account	73 14 11		
" General Account	15 16 8		
Reporter	12 12 0		
Editor's Clerk	10 0 0		
Miss James, Indexing Journal	1 10 0		
Balance being excess over Liabilities	22 6 0		
	<u>£150 1 1</u>		<u>£150 1 1</u>

GEORGE CARPENTER.
A. L. ACHARD.

* Two hundred and ninety-nine Fellows at 10s. 6d.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

COPY OF MINUTES.

GENERAL Meeting held at 20, Hanover Square, W., on Thursday, October 27, 1904, at 8.30 p.m. The President, Dr. ALFRED F. STREET (Westgate-on-Sea), in the Chair.

The Minutes of last meeting were read and confirmed.

The Balance Sheet for the Session ending September 30, 1904, was received and adopted.

The retiring PRESIDENT (Dr. Street) then introduced the President-elect (Dr. W. Bowen Davies, Llandrindod Wells), who then took the Chair and returned thanks for his election.

A vote of thanks to the retiring President was proposed by Dr. GROVES (Carisbrooke), and seconded by Dr. HAMILTON CUMMING (Torquay).

Dr. STREET responded.

A vote of thanks to the Treasurer and Auditors was proposed by Dr. DOUGLAS KERR (Bath), seconded by Dr. LEON (Southsea).

A vote of thanks to the Editors and Librarian was proposed by Dr. SYMES THOMPSON, seconded by Dr. SOLLY (Harrogate).

A vote of thanks to the Council and Secretaries was proposed by Dr. HEALEY (Blackpool), seconded by Dr. LEON.

Dr. SHIRLEY JONES responded.

ORDINARY Meeting held at 20, Hanover Square, W., on Thursday, October 27, 1904, at 9 p.m. The President, Dr. BOWEN DAVIES (Llandrindod Wells), in the Chair.

The Minutes of last Meeting were read and confirmed.

The following candidates were nominated for ballot at the next meeting :—

Edward Gibson Moon, M.R.C.S., L.R.C.P., Broadstairs.
Charles John Stansby, M.D., M.R.C.S., L.R.C.P., London.
Henry J. Johnston-Lavis, M.D.Dch., M.R.C.S., Beaulieu.
W. Ringrose Core, M.B., Bch., Llandrindod Wells.
Thomas Dixon Savill, M.D., London.
Frank Brightman, M.R.C.S., L.R.C.P., Broadstairs.
Alfred Mantle, M.D., M.R.C.P., Halifax and Harrogate.

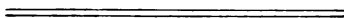
The following candidates were elected Fellows of the Society :—

Wm. Francis Somerville, M.A., B.Sc., M.D., Glasgow.
 John Deloraine Michie, M.B., B.S., Bognor.
 Henry C. MacBryan, L.R.C.P., L.R.C.S., Box, near Bath.
 Alexander Milne, M.B.Chr., Ilkley.
 Alex. Gairdner Lacey, L.R.C.P., M.R.C.S., Ascot.

Dr. BOWEN DAVIES then delivered his Presidential Address entitled, "The Spa Treatment of Arthritis Deformans."

A vote of thanks to the President for his Address was proposed by Dr. M. KERR, seconded by Dr. HEDLEY.

Dr. HEDLEY showed a recent devised modification of the Electric Light Bath.



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BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL
SOCIETY.

THURSDAY, DECEMBER 8, 1904.

OBSERVATIONS ON THE CLIMATE AND HEALTH
RESORTS OF SCOTLAND.

BY NORMAN HAY FORBES, F.R.C.S., F.R.S.(EDIN.), J.P.
(TUNBRIDGE WELLS.)

MR. PRESIDENT AND GENTLEMEN,—My first duty is to offer you my sincere thanks for kindly allowing me the honour of addressing you upon a subject which has always interested me, but which, I am afraid, I can treat only in a somewhat superficial and imperfect manner, as these few general "observations" have been noted during short intervals of leisure in the routine of practice.

In the preface of the second volume of that excellent work, "The Climate and Baths of *Great Britain*," issued by a Committee of the Royal Medical and Chirurgical Society of London, there appears the following passage: "The climates of Scotland have been omitted, as the Committee failed to secure the necessary local co-operation."

To a patriotic Scotsman this statement would be sufficient to kindle the *perfervidum ingenium* of his race, and it has justly stimulated me to make an earnest effort to collect as

much practical information on the subject as possible, and to place it before you, so that you may form an impartial opinion on the climate of that

“Land of brown heath and shaggy wood,
Land of the mountain and the flood.”

The land famed for those minute, but visible, watery particles suspended in the atmosphere at, or near, the surface of the earth, or assuming the form of tiny rain-drops, for hours pitilessly falling to the ground, and proverbially known in the south as a “Scotch mist.”

I am also desirous at the outset of emphasising this fact that, as far as my experience goes, and I think that others will confirm me, many of our invalids would, as a rule, derive greater benefit by visiting a suitable “health resort” in the Highlands or Lowlands of Scotland, at the proper season of the year, than by undertaking a long and fatiguing railway journey to some distant Continental “spa,” which merely happens to be a “fashionable” one. To quote one instance : No one in search of restoration to health, of absolute rest, and of an invigorating climate, ever realised the value of the health-restoring Deeside highlands more than our late beloved and revered Sovereign, Queen Victoria, who, for more than fifty years, spent the autumn vacation in that romantic and wildly picturesque district of Aberdeenshire.

Before passing to a consideration of the climate of Scotland, I would like you briefly to survey the climate of the British Isles as a whole.

The climate of these islands is technically known as a typical “insular” or “moderate” climate, and in this respect the western shores of Europe enjoy a similarly “moderate” climate, though this is not in a literal sense “insular.” In the summer a Continental atmospheric depression exists, aerial currents being drawn from the west and north-west over a very large extent of land, and as this air flows over the vast surface of a wide ocean—the North Atlantic—and from high latitudes, it is cool and moist when it reaches our shores. These conditions are most marked on the west and north-west of Ireland and Scotland, which have thus both the rainiest

and coolest summer, this season being warmer as we go eastward and southward to the south-eastern counties of England. Speaking broadly, in summer a vast cyclonic system develops over Europe and Asia, while in winter an immense anti-cyclone is formed. These two main considerations are of much importance in examining the climate of these islands.

In 1892 Mr. F. Campbell Bayard, in an interesting paper on the climatology of the British Isles, thus epitomises the principal facts relating to their climate :—

(1) With respect to *mean temperature* the sea-coast stations are warm in winter and cool in summer, whilst the inland stations are cold in winter and hot in summer.

(2) The *mean maximum temperature* occurs at all stations in July or August, while the *mean minimum temperature* takes place mostly in December or January, except at Llandudno and the south-west sea-coast stations, where it is later, usually taking place in February or March.

(3) *Relative humidity* is lowest at the sea-coast stations, and highest at those inland.

(4) The south-western district seems most *cloudy* in winter, spring and autumn, and the southern district the least cloudy in the summer months. The sea-coast stations are, as a rule, less cloudy than those inland.

(5) *Rainfall* is smallest in April, and, as a rule, greatest in November, and it increases as we travel from east to west.

Another important factor in an investigation of the climate of these islands is that of the *temperature of the seas* which wash our shores. Dr. Buchan, of the Scottish Meteorological Society, has pointed out that the high sea temperature of the northern islands in winter is one of the best illustrations of the powerful influence of the ocean on climate. He has laid special stress on the influence of the Atlantic Ocean and of the Irish Sea. This is endorsed by the fact that the sea temperature of St. Kilda is as high as that of Penzance, and that of Cape Wrath as high as that of the Isle of Wight.

With regard to *air temperature*, Dr. Buchan states that our climate is “eminently insular,” that is, it is “not subject to great extremes of heat and cold, but is remarkably equable

throughout the year, being much milder in winter and cooler in summer than that in Continental regions *in the same latitudes.*"

An analysis of two authentic series of temperature charts, and of the maps in the "Meteorological Atlas of the British Isles," shows that the isotherm of 46° , which represents the mean temperature of the whole year, skirts the north coasts of the Hebrides and Scotland, the mean temperature increasing as one travels southward, until we find the isotherm of 52° off the extreme south-west of Ireland, whence it passes in an east-south-easterly direction by the Land's End in Cornwall to Jersey. Thus, the mean annual temperature of the Scilly Islands is 53° F. Roughly speaking, Scotland lies between the isotherms of 46° and 48° ; England between those of 40° and 52° ; and Ireland between those of 48° and 51° .

There is yet another factor of importance in connection with the climate of the British Isles, and that is the distribution of *mean barometrical pressure* all over them. A study of the barometrical maps in the "Meteorological Atlas" is not only interesting, but instructive, from a medical and hygienic point of view, as even the monthly distribution of pressure gives a clue to the general direction and force of the predominant winds.

On looking at any given barometric chart, whether monthly or yearly (and in passing one must bear in mind that these readings have all been reduced to their mean sea-level value, and also to 32° F.), one sees at once the isobars have a cyclonic or concave trend in the north, and an anti-cyclonic or convex trend over the south of the United Kingdom. This explains the more settled weather in the south, and the proverbially less settled northern weather, where the pressure is, on the average, lower than in the south. But we must not linger any longer over this part of our subject.

I will now ask you to briefly consider the final factor of importance in connection with our island climate, *i.e.*, that of *rainfall*. Here, again, the most valuable meteorological information has been obtained and placed on record by the able work of Dr. Buchan in Scotland, and of Mr. G. J. Symons

in England, whose classic work on "British Rainfall" will ever rank as a standard treatise on that subject.

In considering the general distribution of rainfall, Dr. Buchan aptly remarks that the key to the subject lies in "the direction of the rain-bearing winds in their relation to the physical configuration of the surface"; and it is a remarkable fact, as regards our British climate, that the greatest differences in *local* climates arise from the differences in their *rainfall*. This fact confirms the real importance of rainfall as a climatological factor. To quote one instance only in Scotland—let us compare the climate of the Island of Skye with that of the southern shores of the Moray Firth. It is curious to note that, while in no month in the year do their mean temperatures differ so much as 2° F., their annual rainfall presents a very striking contrast; that of Skye averaging 100 inches, as against a rainfall of 26 inches in the neighbourhood of Nairn, and of the ill-fated battlefield of Culloden Muir, where the cause of the hapless House of Stuart received its death-blow.

It is interesting to note in passing, that the regions of heaviest rainfall in the British Isles are the western highlands of Scotland, the island of Skye, the lake district in Cumberland and Westmorland, the mountainous districts in Wales—especially those in the north and south-east part—the Dartmoor district in England, the West Galway highlands in Ireland, together with the far-famed Killarney district, and the Macgillicuddy Reeks in County Kerry. In the south of Scotland the rainfall is nowhere excessive; this is due to the south-westerly winds—the rain-producers—having been partially robbed of their moisture while crossing Ireland. In several parts of Scotland—such as the north-eastern part of Caithness, round the shores of the Moray Firth, along the east coast from Peterhead in Aberdeenshire to Burntisland in Fife, in some parts of East and Mid Lothian, and also in Berwickshire, the annual rainfall is *less than 30 inches*. This fact is interesting as it may help in some degree to dispel the popular "hazy" notions about our "cold, wet, and misty Scotland."

Before further studying in detail the climate of Scotland—

which forms the second part of my somewhat discursive paper, we must not forget the importance of the *geological formation* of these islands, as there can be no doubt that the physical influence of soil and of land formation do largely affect their climate. Professor Seeley, of King's College, London, has shown that there are two principal ways in which the geological structure and contour of the land surface may, and does, affect a climate. Firstly, it has a local influence on temperature ; and secondly, it largely modifies the relative durability of the rock-material which determines the elevation of the surface. According to Professor Seeley's valuable opinion, the chief geological formations which influence a climate are : (1) The pebble-beds, sands and sandstones ; (2) the clays and shales ; and (3) the limestones. To these may be added certain crystalline modifications of the simpler forms and those which include the crystalline rock-formations known as slates and schists, usually found in the elevated country on the western side of the United Kingdom and of Ireland.

To sum up broadly, the pebble-beds and sandy soils are dry and warm ; the clay soils are cold and damp ; the limestones forming a medium between them, being characterised by a warm, steamy atmosphere in summer, evolving vapour under sunshine, which is in marked contrast to the dry, bracing air of sandstone districts.

Let us now take a bird's eye view of the leading physical features, the more prominent contours, and the bolder outline of the shape and surface of North Britain—the “Caledonia, stern and wild” of poetic fame.

There are three main natural divisions of the country, viz. : (1) The Highlands ; (2) the Central Lowlands, and (3) the Southern Uplands ; these represent, fairly correctly, the geological structure of the country, and the actual configuration of the land surface.

If we draw a line from Stonehaven, in Kincardineshire, in a south-westerly direction, passing by the northern outskirts of Strathmore to Glenartney, thence through the lower reaches of Loch Lomond to the Firth of Clyde, at Kilcreggan, this line will roughly mark the division between the Highlands and the Central Lowlands.

Again, if we draw a line from the historic town of Dunbar, on the north-east coast of Haddingtonshire, along the base of the Lammermuir and Moorfoot Hills, the Lowthers and the hills of Galloway and Carrick, to Girvan in Ayrshire, this line will, to a great extent, separate the Central Lowlands from the Southern Uplands.

The Highland division of the country is the most extensive of the three, and is characterised by vast, irregular, mountainous masses, which, when viewed from any commanding position, look like a stormy ocean; in which the waves appear to be surging in all directions. These great broad and massive undulations of the earth's crust are, says Professor Geikie, "the wreck of an old and bygone table-land; the upper surface and original inclination of which are approximately indicated by the summits of the various mountain masses, and the direction of the principal water-flow."

This interesting old table-land—of which the present Highlands and Islands of Scotland are the denuded and submerged relics—is of very great geological antiquity, having been in existence before the old Red Sandstone period; it is, in fact, one of the oldest elevated regions of Europe; one which has again and again been submerged, in whole or in part, covered with the deposits of ancient seas and of prehistoric lakes, only to rise again, time after time; thus having those various deposits in large measure swept away from its ever-changing surface by the long-continued action of the different agents of erosion and denudation—especially running water—"Gutta cavat lapidem non vi, sed saepe cadendo."

The Central Lowlands, which lie between the Highlands and the Southern Uplands, consist of a broad depression of fertile low-lying ground between these two table-lands, the "line of demarcation" being, on the whole, very well defined; the principal features of the district showing a north-easterly trend, similar to that of the bounding lines of the division. The major part of the Lowlands is under 500 feet in height, with one or two marked exceptions. One also sees here the various changes produced by the gradual denudation of the softer and more easily disintegrated rocks. Roughly speaking,

the principal hills in the Lowland country form two distinct interrupted belts, extending north-east and south-west; the one facing the Highlands—which might be termed the “Northern Heights,” and the other the “Southern Heights,” as it flanks on the vast district of the Southern Uplands. Between these Northern and Southern Heights there lie the broad lowland tracts which drain towards the Forth, together with the fertile lower reaches of the Clyde valley, and the wide moorland lying between that river and the estuary of the Forth.

We now come to the Southern Uplands, the third great general land division of Scotland, which is bounded on the north by that line drawn from Dunbar, along the base of the Lammermuir and Moorfoot Hills to Girvan in the west; in the south the boundary line being the English Border.

To this “demarcation” there are some geological exceptions, notably in the Cheviots, the Tweeddale, Teviotdale, and Liddesdale districts; but for general geographical purposes we may include all the area lying between the Central Lowlands and the Border.

These Southern Uplands bear a striking *geological* resemblance to the Highlands, being, in fact, a very old Silurian table-land (older than the Red Sandstone period), which has been furrowed into deep ravines and open valleys by the constant operation of surface erosion and denudation, such as running water, rain, frost, ice and snow, possibly supplemented at times by the action of the sea.

Let us now look a little more in detail into the climate of Scotland; and I propose to draw your special attention to three of its principal elemental factors, namely: (1) Height above the sea-level; (2) air temperature; and (3) rainfall. Of these the air *temperature* of any given district during the different months of the year is, as a rule, the most important climatic element. Thus, if we compare the mean annual temperature of the east coast with that of the west, we shall find that they are approximately equal; but the difference between the summer and winter temperatures in both is very marked. Thus, at Oban, the summer and winter temperatures

are 57° and 39° F., respectively, whereas at Barry, in Forfarshire, they are 59° and 37° F., the annual range being roughly 21° and 17° F.

Taking now the winter temperature of Scotland, the most remarkable feature that strikes one is the general north and south direction of the isothermals (or "lines of equal temperature"); and "from this direction," says Dr. Buchan, "it is plain that the peculiar geographical distribution of the winter temperature is not determined by the sun, but is ruled by the influence of the (Atlantic) Ocean, which imparts its greater warmth to the climate by the prevailing south-westerly and westerly winds."

This leads one to emphasise the fact that the *temperature* of Scotland is—during all the seasons of the year—higher than one would expect it to be owing to its geographical position in Europe; while the beneficial and ameliorating influence of the vast Atlantic Ocean, which washes its jagged western shores, is evident in maintaining a temperature much in excess of what is merely due to latitude and to the season of the year; for instance, in Edinburgh the temperature in winter is 27° F., while that of the Shetland Isles is 32° F. So, were it not for that benign oceanic influence, dispersed far and wide by the prevailing south-westerly winds, the mean temperature of the "grey metropolis of the north" would be about 12° F., and that of the Shetlands about 7° ; they then would experience an "Icelandic" winter.

It is also interesting to note that the lowest temperatures occur in the strictly inland or central districts of Scotland, the temperature being lowest at all places corresponding to the isothermal of 38° F. The summer temperature in Scotland has quite a different distribution to that of the winter; the temperature during the summer months throughout the entire west is lower than in the central and eastern districts, which are the warmer; so that in winter the coldest climate is experienced in inland districts, whereas in the summer the warmest climate is found on the central or interior districts. This latter fact has an interesting (medical) bearing in relation to the isothermal of 59° , "which," says Dr. Buchan, "marks

off that portion of Scotland where, owing to the higher temperature, diarrhoea and other bowel complaints raise the death-rate among infants higher than elsewhere during the warmest months of the year."

Let us now consider perhaps the most important factor in the climate of Scotland—important to health-seeker, to tourist and to sportsman—that of *rainfall*. Rainfall, as you know, is largely determined by the course of the temperature during the year, by the character of the prevailing winds as regards their moisture or dryness, and by the general configuration of the land surface over which they blow.

Selecting two types of prevailing winds—the south-westerly and the north-easterly—we find the former reaching the Scottish shores laden with the moisture which they have absorbed in their Transatlantic journey ; on reaching higher latitudes they lose heat, and consequently part with some of their moisture. These are essentially "rainy" winds. On the other hand, the north-easterly winds, which are, as a rule, dry, fresh and rainless, become warmer in their southern progress, having a tendency to become still drier.

On the whole there is nearly twice as much wind from the south-west as from the north-east, the former being most prevalent during July, August, September and October, *i.e.*, during part of the summer and autumn, while in winter it is most marked during December, January and February ; in all these months the rainfall is heaviest, thus emphasising the "insular" character of the Scottish climate.

In March, April, May, and June, the north-east winds are most frequent, and during those months there is least rainfall.

In a few words, the western climate of Scotland is essentially a moist one, while the eastern climate is a comparatively dry one, the driest climates being over the lands surrounding the Moray Firth from Elgin to Dornoch, the neighbourhood of the Tweed about Jedburgh and Kelso, and the low-lying grounds of East Lothian.

There is a marked difference in character between the rainfall in the west and that in the east of Scotland. In the former the rainfall, in similar situations, closely follows the height,

the south-westerly winds reaching a great height in the atmosphere and travelling far inland; while in the latter the easterly winds do not penetrate far inland, nor do they reach any great height in the atmosphere; so that, occasionally, in narrow valleys facing east, along the east coast shores, and in flat, low-lying localities, we find the greatest rainfall during the prevalent easterly winds. This gives rise in certain places to a higher (daily) rainfall during one day than is met with in comparatively rainy districts in the west. Thus, in August, 1877, the rainfall in Edinburgh reached nearly four inches in one day. Again, in the eastern "Straths" and low-level plains very heavy rains, serious as regards damage to agriculture, fall, in association with severe thunderstorms, which, however, are comparatively rare in the western districts.

From a study of the Forty-ninth Annual Report of the Registrar-General for Scotland (the last issued)—there is an instructive chapter on "Weather, and its Influence on Mortality," based on notes made by the veteran Scottish meteorological authority, Dr. Buchan—we find that the year 1903 was characterised by two features: (1) A subnormal mean temperature, and (2) a very excessive rainfall.

The average of the mean annual temperature of the last twenty years is 46.2° F., the mean temperature of last year being 45.9° F. The average rainfall of the last twenty years is 39 inches, the rainfall of last year (1903) amounted to 51.5 inches. The year 1903 was an exceptional one in that an excessive rainfall was accompanied by a markedly low mean temperature; but the mortality in that year was not unfavourably influenced by the excessive rainfall. It was, however, decidedly less than the average, for in the principal towns the total deaths were fewer, deaths from pneumonia and other diseases of the respiratory organs were fewer, the only exception being deaths from tubercular phthisis; there were also fewer deaths from infectious diseases and from old age. It is only as regards infant mortality and the deaths from diarrhoea that a striking increase was observed, the mortality of children under one year having risen from 129 per 100,000 births to 137, and that of diarrhoea from 29 per 100,000 to 35.

As one would naturally expect, the total monthly deaths, also the deaths from diseases of the respiratory organs and from old age, were all more numerous in the winter than in the summer months. The mortality from phthisis was highest in January and March, and lowest in July and August.

There can be no doubt that the most baneful diseases which have a direct relation to the climate of Scotland, are diseases of the lungs and air-passages, such as pneumonia, phthisis and bronchitis, which reach their maximum mortality in winter and in early spring, while in summer the highest mortality is caused by bowel complaints, notably diarrhoea, which is very fatal among infants and the very aged; "nervous diseases," however, seem to be more prevalent in the clear, dry spring weather, accompanied by comparatively cold east winds.

The Registrar-General's annual statistics show that when the temperature rises towards and above 60° F., the mortality also rises, from the prevalence of "bowel complaints," and when it falls below 50° F., the mortality is increased by the presence of chest and throat diseases. Thus, we find that the healthiest temperatures lie between these two points; and, as a rule, for six months in the year the temperature ranges between these two degrees. Scotland's climate, therefore, may, with some justice, be termed a healthy one. Its summer temperature seldom rises above 60° F., its winter temperature does not fall very much below 50° F.

For a winter residence in Scotland, the mildest climate is found along the Clyde, at Helensburgh, in Bute, and along the Ayrshire seaboard; in the island of Arran, where the average temperature is as high as in any other part of Great Britain, with the exception of the south-western counties of England and Wales, and also among the islands of the Inner Hebrides, such as Tyree and Coll islands (where the rainfall is not usually excessive). With reference to the island of Tyree, Miss A. Goodrich Freer, in her interesting book, "Outer Isles," thus alludes to its climate, which, though not cold, is windy and somewhat humid. Miss Freer says: "There is hardly any frost in the island, perhaps because it is not very far removed

from the Gulf Stream, and snow falls seldom and never remains ; the winds, however, are very violent," and as there is no pier nor harbour it is quite common, even in summer, for the little Oban mail packet to have to return without landing her passengers. Of all the Hebridean islands, Tyree seems to me the most favourable for periodic residence as a health resort. Miss Freer thus summarises the advantages of this "outer isle": "With such advantages as excellent golf links, a comfortable hotel, miles of sands, which are an ideal nursery for children, a happy hunting ground for the antiquarian, botanist and ornithologist, Tyree might become, as Mr. Stanford, who had known and loved the island for over thirty years, used to say, the sanatorium of the west." I hope that, when able to obtain further information on the climate of this island, I may be able to better advocate its claims for consideration as a summer health resort, suitable, with improved accommodation, for some cases of phthisis, for cases of "nervous breakdown," for general debility, and for anæmia.

In the choice of a summer Scottish residence, two points must be borne in mind : (1) We must select districts whose height above sea-level is over 500 feet, and (2) those with a moderate rainfall. Such pleasant and bracing health resorts are to be found on the upper Deeside, upper Donside, upper Speyside, over a large portion of the eastern half of Perthshire, and in the highland districts of the south-eastern counties.

To those who are indifferent to a heavy rainfall and its effects, the western highlands afford a total change of climate, with their grand atmospheric effects of light, shade and colour, most beautifully pronounced in the western regions of Ross and Sutherland, where, owing to the shelter afforded by Skye and the Lewis, the rainfall is considerably less. They can there enjoy the most picturesque scenery, which abounds everywhere, from wild and stern grandeur to the richest and softest landscape beauty.

Without further trespassing on your consideration and indulgence, I propose to sketch, in outline only, the principal climatic health resorts in Scotland. Among those mentioned

by Sir Herman Weber, in his excellent work on "The Mineral Waters and Health Resorts of Europe," are the following : Braemar, Ballater, Grantown, Carrbridge, Kingussie, Forres, Strathpeffer, Blair-Athol, Pitlochry, Inversnaid, the Trossachs, Crieff, Moffatt, Bridge-of-Allan ; and of these I shall draw special attention only to Braemar, Ballater, Strathpeffer, Pitlochry, the Trossachs, Crieff, Moffatt, and Bridge-of-Allan.

Speaking of Braemar, observations taken at the meteorological observatory of the Castleton of Braemar—which was founded in 1855 by H.R.H. the late Prince Consort, and maintained by Her late Majesty Queen Victoria, show that this highland health resort, which is encircled on the west, north and north-east by the grand chain of the Grampians, is one of the finest in all Scotland, which the following brief notes will amply justify : The mean barometric pressure, for a period of thirty-eight years, is 28·622 inches (the observations having been reduced to 32° F.); the mean temperature for the same period was 42·8° ; "the range being greatest in winter," says Mr. Mossmann, in his valuable paper on the "Climate of Braemar," "when there is little aqueous vapour in the air, and least in summer when the absolute quantity of water vapour is at a maximum." Then, again, solar radiation is at a maximum in June, while terrestrial radiation is greatest in May, and least in March ; the mean annual rainfall is 35 inches, the maximum for any year being 59 inches (in 1872), and the minimum 25 inches (in 1887). The three driest months are March, April and May ; the three wettest, August, September and October. The relative humidity of the air—deduced from daily readings of the dry and wet bulb thermometer—is 83·9, complete saturation being represented by 100, the air being driest in June and dampest in November. During the thirty-eight years of bi-daily wind observations, for nearly half the time the south-west wind is the most prevalent (44 per cent.), being most frequent during autumn and winter ; while, on the other hand, the warmest wind on the mean of the year blows from the east and south (especially during the spring and summer months), and the coldest, the north and north-east.

As regards sunshine at Braemar, the Jordan photographic recorder gives us an average result over a period of seven years, June as the sunniest month ; while in December and January there is the least amount of sunshine, only 4 per cent. of the possible. As regards snowfall, gales and thunderstorms, the records show that snow has fallen on the mountains in every month of the year except August, the maximum being reached in March, an unusually cold month in the ten years under observation. Thunderstorms nearly always occurred in summer, when the temperature is rising quickly and ascending currents are consequently stronger. Gales are also comparatively rare, especially from May to July.

Of all the Scottish "spas," Strathpeffer deserves considerable attention on account of its valuable sulphur and iron waters, and its mild climate. For a full and complete account of its climate and waters there is no better monograph than that written by Dr. Fortescue Fox, who has devoted many years to the study of their undoubted value in the treatment of certain chronic diseases.

According to Dr. Fox, the following are the principal indications for the use of the Strathpeffer waters : Atonic and catarrhal dyspepsia, with or without constipation ; chronic affections of the liver, both organic and functional ; conditions of abdominal plethora ; some phases of chronic gout and rheumatism ; chronic tubercular or scrofulous affections ; as also certain cases of chronic phthisis, chronic catarrhs of the throat, nasal passages and bronchial tubes ; and, lastly, in most chronic skin affections.

As regards the climate of Strathpeffer, Dr. Fortescue Fox draws special attention to the following points : its proximity to the sea, being only five miles distant from the Cromarty Firth, its natural situation and aspect, the remarkable condition of its vegetation, the direction of the prevailing winds, the influence of the surrounding mountainous table-land, and the presence of aqueous vapour in the atmosphere.

The annual mean temperature of Strathpeffer is 45.5° F., while the mean daily range, which is the difference between the maximum and minimum temperature, is, for the summer,

13'1". The rainfall on the average of the eleven years (1885 to 1895) is 30'99 inches, and the average relative humidity 83'5, saturation being expressed by the figure 100.

As regards the seasonal distribution of sunshine, Dr. Fox states that spring is marked by a high percentage of sunshine that is, by an exceptionably clear atmosphere; while it is remarkable that the three winter months have an average total of 131 hours, against 77 in London; and in conclusion, Dr. Fox remarks that, so far as experience at present extends, Strathpeffer enjoys a temperate and fairly equable climate, combining some of the advantages both of sea and mountain at the same time, and that it is to a large extent free from the drawbacks that accompany a situation too exclusively, of one kind or the other.

A few words in passing about Pitlochry. Pitlochry is a beautiful village on the banks of the Tummel, below the Pass of Killiecrankie, standing more than 300 feet above the level of the sea; it is somewhat "shut in," having a less bracing climate than some of the other Perthshire spas.

In the neighbourhood of the Trossachs there are several health resorts, combining a mild climate with some of the most beautiful scenery in Scotland—notably on Loch Achray, Loch Katrine, Loch Lomond, Callander, and Inversnaid.

Overlooking Strathearn, and on the first slope of the Grampians, lies Crieff, in an open and airy situation, and with a very low rainfall. It possesses some valuable saline mineral waters.

In Dumfriesshire we have the cheerful little town of Moffat, standing in the upper part of the Vale of Annan, sheltered by hills on the north, east and west. It is a "spa" of old repute, in the 18th century somewhat resembling the Kentish spa of Tunbridge Wells, being famous for its pure and salubrious air, pleasant scenery, and its mild sulphurous and saline waters, long used in chronic gout and rheumatism, and in some abdominal disorders due to the effects of a tropical climate.

Bridge-of-Allan—"On the Banks of Allan Water," at the foot of the wooded Ochils, and in view of the lofty Grampians

—somewhat resembles the English Cheltenham. It is sheltered from the north and east winds, spreading itself out into detached villas, pleasant gardens, with clean, wide roads, studded with trees. It possesses some saline waters, less used than formerly; but it has a singularly mild, dry and equable climate, especially during the spring and autumn.

There are many more Scottish watering-places which one might refer to in detail, but I must be content to merely enumerate them; such are, Ballater, with its regularly-built and good houses, its high situation, and its chalybeate mineral waters; at Pananich, on the other side of the Dee, are waters suitable for anæmia, the scrofulous diathesis, and for some forms of dyspepsia; Rothesay, the capital of the island of Bute; the seaport of Ardrrossan, Roseneath; with its mild spring climate; Dunoon in Argyllshire; Comrie in Perthshire; Portobello, the watering-place of Edinburgh; Musselburgh; the town of Forres, North Berwick, sometimes popularly called the “Biarritz of the North”; the tourist-trodden Oban; the town of Peebles; the sulphurous mineral waters of Innerleithen; the historic town of St. Andrews; the highland village of Kingussie, as well as that of Tomintoul; Birnam, Dunkeld, Alyth, Killin and Arrochar.

I must, however, draw this lengthy paper to a conclusion, by placing before you some valuable *local* information kindly supplied me by the medical officers of health of nearly all the counties of Scotland, both in the Highland and insular regions, as well as in those of the Lowlands. I trust, therefore, that your patience will “hold out” for a little while longer.

Taking the various counties of Scotland in alphabetical order, I have been able to obtain reliable information from some of the county medical officers of health. Thus, in Argyllshire, Dr. R. McNeill writes me, that during the summer months visitors come to reside in various places along the coast of the mainland and in the islands. Of the mainland resorts, Oban holds a prominent place, and there is an interesting pamphlet on it as a health resort, by Dr. Bailly. As regards Ayrshire, Dr. Macdonald writes that the rainfall of the county averages about 46 inches annually, but varies

considerably in different parts of the county ; along the shore from Ardrossan to Ayr, the mean annual rainfall is 36 inches, but in the more hilly parts it reaches from 50 to 60 inches and upwards, and falls, on an average, about 198 days in the year. The humidity, as in other counties on the west of Scotland, is higher than that of the east or midland parts ; the mean annual relative humidity for the county is about 86 (saturation being 100), and it may be said to vary from 80 to 90. The mean relative humidity for Scotland, as a whole, is about 83. The mean temperature, like the rainfall, is somewhat higher than in the east and central parts of Scotland. The annual mean for Ayrshire may be considered about 47° , and that of Scotland, as a whole, a fraction less. The prevailing winds are south, south-west, and west. The chief health resorts in the county are all on the coast, viz., Largs, Saltcoats, Troon, Prestwick, Ayr, and Girvan. The annual rainfall of Saltcoats, Troon, Prestwick, and Ayr is practically the same, and is the lowest in the county. Dr. Macdonald adds : " I cannot say that the climate of any of these health resorts is of special value for any disease ; but the facilities these towns afford for golfing, cycling, motoring, &c., and trips by steamers during the summer months, make them favourite watering-places."

In reference to Berwickshire, Dr. R. S. Gibb tells me that the only health resorts in that county are Coldingham, St. Abbs, and Eyemouth on the sea. Coldingham is badly drained, St. Abbs, though healthy, lacks proper accommodation, while at Eyemouth there is sea-bathing, but the place being a busy fish-trading centre is apt to be somewhat dirty and " odorous."

Lauder, an inland village in Berwickshire, is 600 feet above sea-level, with fine air, open and breezy commons, good golf links and bowling green, but it lacks good accommodation ; the water is good, and a new drainage scheme is in progress.

Dr. J. J. Wilson, the county medical officer of health for Lanarkshire, writes me, that the climate varies throughout the county, mainly with the altitude. The highest inhabited village is Leadhills, which stands 1,300 feet above sea-level, but " most of the populous places will have an average altitude of 150 feet above sea-level (O.S.D.). There are no special health

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resorts, but along the valley of the Clyde there are villages frequented by visitors in the summer. There are also a few places recommended for consumptive people, such as East Kilbride and Lanark."

In the county of Kincardine, Dr. W. A. MacNaughton, the medical officer of health, very courteously placed the following information at my disposal. He says: "Though the conditions are very diverse—the county extending from the sea-board to the Deeside highlands—the climate generally is healthy."

Dr. Cameron, who kept records at Fetteresso, an inland station, for forty years, records the mean summer heat for that period as 59° F., and 36° F. in winter, the annual mean temperature being 47° F. The average number of days on which rain or snow fell was 177, the mean rainfall 33.5 inches. The prevailing winds are east and south-east in spring, south and south-west in summer and autumn.

"To put my own impressions briefly," adds Dr. MacNaughton, "we have an ideal summer climate, except for occasional sea-fogs in May and June, which are blighting to vegetation. Our springs are very trying, particularly during the prevalence of south-east winds, or 'sea-piner,' as that wind is termed locally. I have not been able to verify any injurious effects of climate upon health, further than this, which is merely an impression, that our crofters and others who lead *exposed* lives are liable to chronic rheumatism when they attain middle life to a greater extent than similar workers in other counties, where the late winter and spring conditions are more genial."

Dr. MacNaughton mentions two health resorts: Stonehaven, on the coast, 15 miles south of Aberdeen, situated on a bay sheltered from the north, with an excellent water supply and good facilities for sea-bathing, boating, golf, tennis, bowling and cycling. The other health resort is Banchory, on the upper Deeside, surrounded by miles of pine-woods; it lies in the valley of the Dee, and is sheltered from the north. It is 166 feet above sea-level; its climate is mild and genial, and very suitable for consumptives. The water supply is excellent.

One of the most interesting counties as regards climate

and its relation to health is that of Nairn, with its mild and dry climate, sandy subsoil, special sea-baths, its good water supply and drainage. The average annual rainfall for thirty-five years (1866 to 1900) is 24·71 inches, and the average annual temperature maximum 52·7°, minimum 39·8°, and mean 46·2° F. In the Scottish Meteorological Society's Report on the Annual Rainfall the question is summarised by the following note : "The part of Scotland where the rainfall is smallest is the district round the Moray Firth, where the annual amount varies from 23 to 26 inches. The absolutely driest place is Nairn and vicinity."

Nairn is one of the most suitable of Scottish winter resorts, as there is not much frost nor snowfall, mist and fogs being rare ; the chief characteristics of its winter climate are pure, dry air, sunshine and comparative warmth, with a porous soil, rapidly drying roads and paths. The geographical position of Nairn partly explains the equable character of its climate, lying near the sea and at the northern edge of the great Moray plain, it stands in the centre of a semi-circle, the circumference of which is formed by the Grampians on the south and west, and the Ross-shire hills on the north. These encircling hill-tops moderate the force of gales, extracting their moisture from them, so that they reach Nairn comparatively dry and rainless. The prevailing winds are southerly and westerly, while, during the spring, the winds blow most often from the north and east.

"In the adjoining counties of Cromarty and Ross-shire the climate varies very much," says Dr. W. Bruce, the medical officer of health, "on the two different coasts ; on the whole, however, it is mild and somewhat moist, unless on the extreme east side, which is perhaps the driest part of all Scotland."

In the west, especially in the Island of Lewis, there is a considerable rainfall, while the temperature there is mild. In no part, except at 600 feet and more above sea-level, does much snow fall, nor does it lie long in the winter. The chief health resorts are Strathpeffer and Rosemarkie, a beautifully sheltered seaside resort, protected on the north side, and though open to the east, yet not harassed by winds from that

quarter, owing to the ground rising steeply behind it to the west. In reference to the climate of Strathpeffer, Dr. Bruce considers that, with the exception of Moffat, it possesses the purest air, and is the most picturesque, of all British spas.

The public health of these counties is good, except in the fishing villages and the more congested districts, where, were phthisis stamped out, as it might well be (*seeing it is, as a rule, imported from the south*), the rate of mortality, barring that from measles and whooping-cough amongst children, would be very low.

This is all the information I have at present been able to collect in relation to the separate counties of Scotland.

I must again thank you for so kindly listening to a lengthy discourse on the "Climate and Health Resorts of Scotland."

DISCUSSION.

Dr. FORTESCUE FOX said he felt sure all would unite in warmly thanking Dr. Forbes for the excellent paper he had read, which revealed such an amount of research and presented so much information that it would take a valuable place in the Society's records. It would also be agreed that it was a very serious omission from the two volumes which professed to deal with the climates of Great Britain, that North Britain was left out. Still, the Scottish garrison in London was so large and powerful that he felt sure some among them would be found able and willing to supply that omission in a permanent and satisfactory way. He desired to emphasise one or two points which Dr. Forbes had brought forward, and perhaps refer to one or two which the author had not specially mentioned. He (Dr. Fox) was struck, as many had been, by the marked differences and contrasts in the climates of Scotland, and especially by the extreme contrast between the eastern and western climates. In all the local Scottish climates the eastern or western elements usually predominate. For example, in the Western Highlands, in Skye or Ullapool, the softness of the air and the luxuriance of vege-

tation remind the visitors of Cornwall and Jersey, with their hedges of fuchsia and hydrangea and myrtle. But forty to sixty miles eastward, on the eastern coast, an entirely different condition prevails. In many exposed places, such as Lossiemouth, the coast is swept by keen winds, and arboreal vegetation is reduced almost to a minimum. Corresponding to these physical contrasts there are interesting medical contrasts. Many invalids, especially those in the decline of life, and cases of catarrhal liability, and especially bronchial catarrh, must, as a rule, be sent to the west, and often do well there, both in summer and winter. On the other hand, for middle-aged and younger people, who have not lost the power of reaction to stimulus, there is no climate in our country to surpass that of the East Coast of Scotland. Particular interest from a climatic and medical point of view attaches to that wonderful corner of Scotland in the north-east, the district or peninsula which extends from the Dee to Dornoch, which is exposed along its northern face almost to the Polar Seas, and which on the east looks across to the German Ocean—a large square region mostly high and rocky, excepting along the coast-line, and all of it distinguished by similar characters of climate. What are these general characters? In the first place, there is the important fact of latitude, it is placed so far to the north, in fact, the most northerly part of Great Britain to which invalids resort. In other countries, in Norway, Sweden and Russia, there are of course health resorts further north, but not much further north. What does this fact imply? It implies very long summer days, an important fact, especially in an open-air life. Then there are characters of climate dependent on the solar radiation, an influential although ill-understood factor. In his belief the solar radiation in these northern regions had a specific character, connected no doubt with, although perhaps not wholly explained by, the relatively high diathermancy and transparency of the atmosphere in the north. An atmosphere pervious in this high degree belongs only to northern and mountainous localities. Therefore in such a climate the elements of the solar ray can penetrate to the earth and are received by us. It is this quality of the climate that

imparts an added brightness to flowers and to the plumage of birds ; and it is no doubt of great importance from a health point of view. Another general character of the region referred to is the coolness of the summer season. He (Dr. Fox) had long believed that there were many among those who frequented the health resorts who should not be subjected to hot summer climates, and large numbers of these were nevertheless recommended every year to warm or hot valley climates on the Continent.

Cool summers, a singular clearness of the atmosphere, added richness of solar radiation and increased duration of daylight, were some of the features of this climate which had a certain medical bearing. It should also be remarked that a low rainfall was experienced in this part of Scotland, but it was noticable that the high rainfall of other parts of the country did not seem to be prejudicial to health.

Whilst the paper was being read he had asked himself : What are the conditions that benefit most decidedly under the north-eastern climate ? Certainly foremost among them must be included many of the neurasthenias of middle life, which are becoming so distressingly common. He referred especially to the numerous forms of nervous "breakdown," sometimes veiled under the name of *dyspepsia* or *insomnia*, or even *anæmia* or *gout*. Cases of general depression and sluggishness, convalescents, especially those recovering from neuritis and other nervous disorders, might be expected to do well. There were also circulatory disorders, particularly those accompanied by frequent action of the heart, Graves' disease and all allied conditions. If such invalids were sent up into the hill country in Aberdeenshire, and made to live a simple, tranquil, open-air life they would generally be found to derive marked benefit.

He could not conclude without naming an incident of the past year which all Fellows must regret. It was deplorable that the observatory on Ben Nevis, which had been carried on for twenty years, should be closed now, because it supplied most important information from the highest station in the British islands.

Dr. LEONARD WILLIAMS said he was pleased to add his tribute of appreciation to the interest of Dr. Forbes' paper, the only criticism which he had to offer being that the paper contained too much information. He had come there expecting to hear about the health resorts of Scotland, but he felt that he had been listening to a disquisition on the heavens above, the earth beneath, and the waters under the earth. It was perhaps quite in accordance with the fitness of things that this should be, for it was understood that Scotsmen not only regarded the universe as their peculiar inheritance, but that they also claimed a special reversionary interest in the Kingdom of Heaven itself. Even in that portion of the paper which did deal with Scotland, he felt that he had been hurried o'er crag and rock, from Berwick in the south to the uttermost highland loch, and from Greenock on the west to Leith on the east, and he consequently felt breathless and bewildered. But no doubt when the paper appeared in the *Journal* members would be able to digest it and appreciate it at its true value. Dr. Forbes began by stating—what most of those present had already noticed—that there was nothing about the health resorts of Scotland in the publication of the *Medico-Chirurgical Society*. When he first noticed that omission he thought it did not accord with the ordinary business instincts which one was accustomed to associate with friends north of the Tweed. And he wondered how it was. On reflection, however, he had changed his mind, and was now of opinion that this was quite in consonance with the national characteristic of caniness; the reason why the Scotsmen had preferred to say nothing about their health resorts being that they could not honestly say anything which was favourable. That at any rate seemed to him the most likely explanation of an otherwise inexplicable silence. In so far as he had gathered anything from the bewildering amount of information laid before the meeting, he had gathered, as one would expect under circumstances of that kind, that Scotland was an ideal place to live in. He would imagine that anyone who had never been to Scotland and who had heard Dr. Forbes' paper might picture it as a sort of island valley of Avilion, where King Arthur went to heal him of his grievous wound.

Where falls not hail or rain or any snow,
Nor ever wind blows loudly; but it lies
Deep meadowed, happy, fair with orchard lawns
And bowery hollows crowned with summer sea.

If anyone goes to Scotland in the expectation of finding anything even remotely answering to this description he will be disappointed. The Scottish climate is like the Scottish character, cold and harsh on the surface, with solid underlying merits, which, as a rule, take a deal of finding.

Dr. SYMES THOMPSON remarked that both the preceding speakers, who had contributed so much to the debate, began by referring to the absence of any account in the volumes of the Medico-Chirurgical Society of the climate of Scotland. He took an active part in the formation of that Committee and in the preparation of those volumes, and there was great difficulty in procuring information upon many points. Wales and Ireland and Scotland gave the Committee a great deal of trouble, and little by little it became necessary to omit much from the original scheme. The aim had been to bring forward speedily a full and complete digest of the characteristics of the climates of the British Isles, but each paper became more elaborate than the one which preceded it, so it came to pass that the Committee was obliged to content itself with the omission of the very important subject brought forward that evening.

The last speaker, Dr. Leonard Williams, had criticised, with his accustomed brilliancy, the paper of the evening, but it struck him (Dr. Symes Thompson) in exactly the opposite way. He thought the salient characteristics of the climate of Scotland had been brought forward with so much charm that a difficult subject had been made plain. Dr. Forbes had ably dealt with the reasons for the differences of climates of the east and west coasts, and the complex geological questions had been carefully surveyed. He dealt with those early formations which had undergone such denudation that the mountains of Scotland had become even lower. The grand mountains of which we had the remains in Scotland were probably more elevated at one time than the Pyrenees or the Alps, and they

were now lower simply because they were older. The characteristic geologic formation had, he thought, much to do with the general climate. In such a survey as the author had given it was very helpful to have the geography, the geology and the meteorology put forward side by side, and upon that to base special climatology; this had been done in a very helpful way. People could not expect to have a cut-and-dried and complete demonstration of the exact disease for which every square mile of the country was specially fitted. The way in which Dr. Fortescue Fox had described the characteristics of that beautiful bit of the north-east of Scotland with which he was so familiar, should certainly draw all the members there. It had been his lot to decide which side of Scotland to choose, whether the Black Isle (?) or Dumfries; he had feared that in Dumfries he might find it so humid as to cause him to regret his choice. However, the year happened to be a very dry one, so that he had no reason to regret it. To go a journey of 625 miles with a ten or twelve mile drive at the end of it was a serious undertaking. The paper gave much information useful for a selection of suitable places for special diseases, and when published would prove to be a mine of great value, to which members would refer with pleasure and advantage.

Dr. WARD-HUMPHREYS humourously remarked that "on that occasion only" he must dissociate himself from the criticism which Dr. Leonard Williams had seen fit to make; for if the paper to which they had listened had hurried him on at too great a speed from one part of Scotland to another, it was quite evident that, so far as northern geography was concerned, Dr. Leonard Williams had not learned to think imperially. At the same time he (Dr. Ward Humphreys) confessed that the paper would have been easier to follow if a large scale map of Scotland had been exhibited, because not only were the distances great, as Dr. Symes Thompson had pointed out, but many of the names were, to a mere southerner, as difficult to understand as they were almost impossible to pronounce. He desired to offer his very humble, but very cordially appreciatory remarks upon the wide learning and the enquiring spirit which had produced and were so clearly

exemplified in the paper to which they had listened with so much pleasure. The paper was thoroughly Scotch. It was full of detail, full of enquiry, full of honesty and full of caution—it was the honesty which he liked best. Several points struck him, but it was difficult to mention them all.

At the outset he noted the extreme moisture of the climate. He had often wondered at some of the habits of the Scotch, but he now understood that absorbing so much moisture through their lungs, they were able with impunity to put alcohol in a neat condition into their alimentary canal. The honesty of the paper was evidently infectious, for Dr. Fortescue Fox was, of course, up in arms that it should be suggested that there could be any health resorts on the East Coast, and he had pointed out in a sufficiently graphic manner how perilous it was to leave the West Coast of Scotland even for a moment, and he (Dr. Ward Humphreys) would carry away from the meeting a very lively recollection of the terrors of that square peninsula which, jutting out towards the north-east of Scotland, was swept by the storms and inhospitable winds from that direction, and which, to make matters worse, were dumped from Germany. But he would like, in a more serious vein, to throw out an enquiry as to whether it was always wise to regard health resorts merely from the point of view of isotherms and isobars. It appeared to him that mere temperature, as recorded by the thermometer, and mere barometric pressure were not always either safe or complete guides in regard to matters of health. It had always appeared to him that there was a something in sunshine which affected the human body to which the glass and the mercury were not responsive. He was sorry that, despite all its advantages, it could not be claimed that Scotland was a sunny place. He did not, of course, desire that the present meeting should resolve itself into a kind of medical Culloden, and he would be very sorry to see his Scotch friends defeated, if, indeed, it were possible to imagine that such a fate would ever overtake a Scotchman. He presumed that it was the fact that all Scotchmen were strong and vigorous, which enabled so large a battalion of them to leave the health resorts of Scotland and

establish themselves in London, and he congratulated them upon having discovered that Scotland was such an excellent place to live out of.

There was another point which had been made very clear by his Scotch friends who had spoken, and that was the perils of going to Scotland at all ; for it had been made evident that if one went to the West Coast, one was in great danger of suffering from acute bronchitis ; if one went to the central portion, it was perfectly certain that one would be attacked by some violent intestinal disturbance, whereas if one went to the East Coast, it had been pointed out by authorities of the West Coast that a long list of diseases was imminent, added to which, the view from that East Coast was "made in Germany." In these days of agricultural depression, it added to one's own depression to hear that if one engaged in agricultural pursuits in Scotland, one was almost certain to be prematurely cut off by acute rheumatism. He had always admired the courage of the Scotch, but never more so than now, for they had recognised their difficulties, and in order to promote the success of their health resorts had met those difficulties by suggesting that their patients were certain to get well if only they would immure themselves in huge buildings of granite, where from a glass outhouse or a conservatory they might, with a certain degree of safety, be allowed to catch a glimpse of the sun's fitful gleam. He thought that those who were unable to afford the comfort of such establishments had better come down to the South. He did not think it necessary to say a single word in defence of the South. The South might have its disadvantages ; it might be, as Dr. Forbes had indicated, "the place where the phthisis came from," but he did feel that he ought to offer a word of apology for being one of those who lived in the South, which occasionally imposed upon the salubrious atmosphere of Scotland any additional diseases to those which he understood were indigenous and found a congenial home in the "Land o' Cakes." But apart from that, he was sure that everyone present had thoroughly enjoyed listening to and learning from the paper they had heard, and he was equally sure that there was no one present

who would not desire to join most cordially in thanking Dr. Forbes for his very elaborate and learned contribution. There would in future be no reason whatever why the claims, if not the advantages, of Scotland should not be properly represented in any future edition of the work on the Climate of the Health Resorts of the United Kingdom ; and he felt confidence in commending the suggestion to Dr. Symes Thompson, who had done such great work in this direction.

Dr. BLACK JONES wished to ask a question bearing on the temperature of Scotland. It had been stated, and was well known, that the western coast of Scotland was much warmer than the eastern, and that was usually attributed to the proximity of the Gulf Stream. No doubt that was the great factor, but one point may have been overlooked, viz., the excessive rainfall, and the consequent liberation of heat in striking the ground. He believed it had been stated that the temperature of Ireland was raised about 2°, owing to the excessive rainfall.

Dr. MOXON asked permission to say a word as a resident midway between North and South. Much had been said that evening which might cause one to believe another serious engagement was imminent between North and South. One had heard of a medical Culloden, and it was to be hoped it would not assume greater proportions. He was one of the founders of the Society, and it had been his privilege to attend many of its meetings, and he had never heard a paper read at any of them which did not leave the impression that in England, Scotland and Ireland there were climates which were suitable for almost all diseased conditions, and for almost every period of the year. One of the objects of the Society was to bring those advantages more prominently before the public. He would like to know whether the influence of the Society had been felt up to the present time in staying the annual migration to the Continent, which was one of the reasons for its formation. It was a great pity that the Society did not bring before the public more than it did, the advantages of the various home climates. It was all very well for the members, as medical men, to meet and discuss

those advantages, but the general public had not yet been sufficiently made acquainted with them. The list of them had been considerably extended by Dr. Forbes' paper, and a knowledge of them should tend to keep our people more in their own land. He was very much surprised to see a little while ago that an unpatriotic arrangement had been made by which people could be sent out of this country at a cheaper rate and maintained at less cost than had hitherto been the case, and he imagined that would be a blow to British health resorts. He was aware that the expense of British health resorts and their difficulty of access had operated considerably against them, but if the advantages were brought prominently before the public, and the municipal authorities and railway companies would give greater facilities, much would be done towards developing those resorts.

Dr. SOLLY (Harrogate) wished to join his thanks to those already expressed by others to Dr. Forbes for his valuable paper, which he felt would be even more valuable when it appeared in print than when read, as it contained so much information which was worthy of careful thought and investigation. As a small point of criticism, he ventured to hope that when the paper was published, those passages referring to Strathpeffer as "the Harrogate of the North," or to another place as "the Cheltenham of Scotland," should be omitted. All who were attached to health resorts would do better to try and develop the individual features of each place than to compare one with another; for hardly any two places are really comparable, though most have features which are complementary to those of others. Invidious comparisons were likely to defeat the primary object of the Society instead of advancing it.

With regard to the idea of trying to stem the tide of migration to the Continental spas, he thought it would be agreed that more matters were settled by sentiment than by sense; and there was, and always would be, a large amount of sentiment in the choice of a health resort. Any health resort which would introduce roulette would count at once, from that fact alone, on a large measure of popularity from the

class of people from whom the Continental resorts derived their profits. English towns could not go in for the attractions to be found at health resorts abroad, but there was much good to be derived from English resorts, even if the climatic conditions were not equal to those abroad. The essence of the English climate was its variability, and the success in the world of the British nation was largely attributed to its power of adaptation, which was learned under compulsion. Dr. Leonard Williams had pointed out in lectures that most of the things which were good for us were distinctly unpleasant ; or at any rate, all the nice things were not good for us. Some of the beneficial features of our health resorts were not pleasant, and although it would be difficult to persuade the public to accept that as an argument that they were all the more likely to be beneficial, still, the careful development of the really "curative means" of each health resort was bound to result in the creation of an ever-increasing number of grateful patients, whose good word, based on actual experience of benefits received, was the very best advertisement, and the most reliable source of prosperity.

Dr. HAY FORBES, in replying on the discussion, said he much appreciated the kind reception of his effort to deal with what had been described as "too big a subject." It was a very "big subject," and if he had tried to bring in all the health resorts of Scotland in detail, the result would have been as large as a volume of the *Transactions of the Medico-Chirurgical Society*. He very much appreciated the remarks of Dr. Fortescue Fox, based upon his great experience of Scotland, and especially the north-eastern portion. However "terrible" that climate might be, he pointed out that it was from *that* district that the men of the strongest constitutions, physical and mental, came. And they were the most business-like people in the world, because the City of Aberdeen was said to be about the only place "where Jews did not flourish." It is reported that one Jew got there once, but he could not get away again, because he could not collect enough money with which to pay his return fare ; but eventually some Jews sent him relief, and they were *German* Jews. He thanked Dr.

Leonard Williams for his refreshing criticism, and regretted he had not a map large enough to serve the purpose required. If anyone had experienced difficulty with the names of places mentioned, the Chairman would bear him out that those names must "take a back seat" in comparison with some Welsh names, and he felt very thankful that the President had not given any Welsh names. He also thanked Dr. Symes Thompson, who had done so much in the original compilation of the "Baths and Climates of Great Britain and Ireland," issued by the Medico-Chirurgical Society. He had tried to sound the feelings of the profession in Edinburgh as to the omission of Scotland from that volume, and he believed it was due to the natural independence of the Scottish character, and that, though they had "annexed" this country, as they did on the accession of James I., they could not give up their national right of describing their own health resorts, and do their own work in their own way. Had a "Scottish Committee" been asked to write on the health resorts and climate of their own country, he thought that, after having once got them to work, the difficulty would be to get them to stop. So perhaps the Committee of the Medico-Chirurgical Society were "wise in their generation." He agreed with the general regret at the discontinuance of the Ben Nevis Observatory, which had furnished some most useful and valuable information. As soon as the fact was known a German application was made to the Foreign Office to take it over. That would show what foreign aggression meant, when it aimed at the grandest mountain in Scotland. He thanked Dr. Ward-Humphreys for referring to a subject which he (Dr. Forbes) had not time to deal with, viz., the influence of sunshine on health resorts. Many places in Scotland had not as much sunshine as others, but there were places, especially along the Moray Firth, where there was almost perpetual sunshine in the daytime, and there was thus increased length of day for the open-air life of invalids, as shown by Dr. Fox. It was difficult to find information which properly brought out the point referred to by Dr. Black Jones, viz., the liberation of heat by rainfall and the consequent elevation of the average temperature. The

matter was an important one, and had been studied by Dr. Buchan. He would take care, as requested by Dr. Solly, that such expressions as "the Harrogate of the North" should be deleted from his paper if it should be thought worthy of being included in the Transactions.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

WEDNESDAY, JANUARY 18, 1905.

CLIMATOLOGY FROM A MEDICAL STANDPOINT.

CHARLES W. BUCKLEY, M.D.LOND. (BUXTON).

THE study of climate in its therapeutic aspects is probably only in its infancy, and there is a vast field open for work in this direction which should attract the members of this Society. Too long we have based our opinions of climates not personally known to us on the meteorological records alone, and have arbitrarily classified them on the meteorological basis of hot and cold, humid and dry, which is analogous to classifying drugs according to their physical and chemical characters, rather than to their therapeutic effects. Dr. Leonard Williams¹ has recently said that the meteorological supports upon which we have been accustomed in matters climatological to rely have their very definite limitations, and he thinks we shall be wise if in our future observations on these important points we trust more to subjective and less to objective phenomena, a view with which I entirely agree. We cannot deduce the action of any particular climate on the system from the study of any single meteorological factor, nor do we sufficiently understand the combinations into which such factors enter, and their influence upon each other, to justify us in relying entirely upon meteorological observations in the study of climate, and there are probably atmospheric peculiarities of the greatest importance to the human organism of which we have no knowledge. It has well been said² that the human body is an instrument with a latent capability of indicating on a single scale its appreciation of the infinite number of combinations of factors which go to make up climate. It is therefore evident, I think, that subjective observations must form the basis of medical climatology, made as far as possible by trained observers, and supplemented by meteorological

observations taken at different hours to the present ones. On this point we might take a lesson from our Continental neighbours. At Davos, for example, the observations are taken at 7.30, 1.30, and 9.30, the early and late hours giving much more accurate means than those taken at 9 a.m. and 9 p.m., the usual hours in this country, while those made at 1.30 are those of most value in estimating the climate from the invalid's point of view, since it is about that hour that he is most likely to take open-air exercise. Owing to the lack of observations about this time our English climates appear in an unfavourable light, especially as regards humidity. The relative humidity of Davos in December and January, 1903-4, at the time of the morning observation was 95, a much higher figure than that of any English station, but that taken at 1.30 was 78, a figure which is much more in accordance with the character of the climate as it is known to us from subjective experiences. This is only an isolated example, but will serve to illustrate my contention as to the hours of observations.

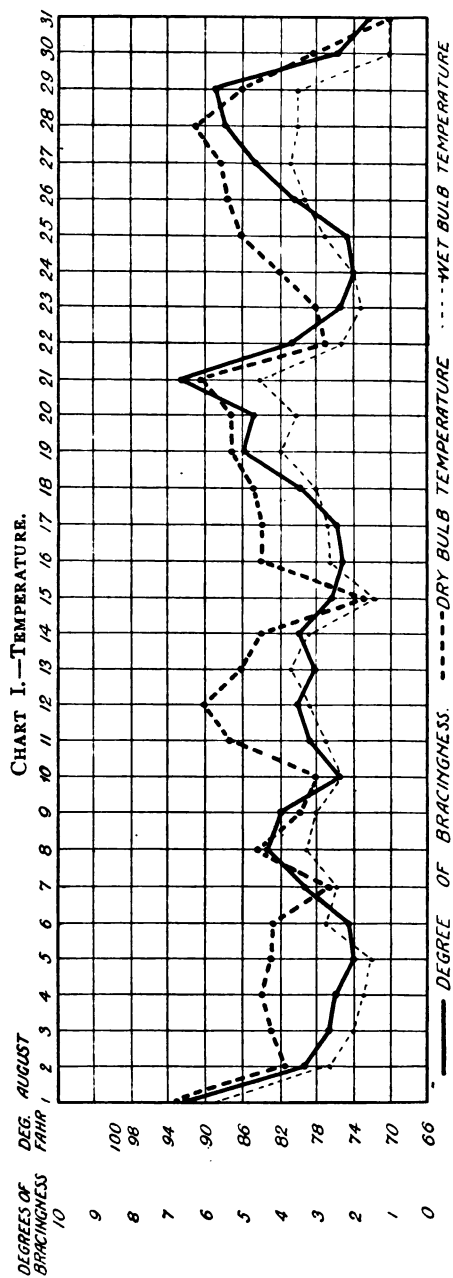
The chief subjective observations to be made in the present state of our knowledge must be limited to the character of the weather day by day, whether bracing, relaxing, stimulating, or depressing, and the subjective sense of temperature, which will be frequently found to differ from that recorded by the thermometer, owing to causes with which I shall shortly deal. Professor Abbe³ has suggested that a daily record of weather should be made under the following descriptive terms: harshness, rawness, penetrating, mildness, softness, exhilarating, stimulating, invigorating, oppressive, weakening, cheerful, too wide and vague an assortment for practical purposes, but we have probably all of us made use of the majority of these terms to describe the weather at one time or another. The study of these subjective characters is at the outset complicated by the absence of a standard from which variations might be recorded on a definite scale, and it is inevitable that there should be considerable differences in the estimates of individual observers, and especially at different stations. In a sedative climate a certain combination of factors would be estimated as constituting a bracing day,

which, if occurring in a place normally possessing a bracing climate, might be recorded as sedative or even relaxing, and it would therefore be necessary in attempting to investigate the factors giving rise to such characters to study the daily records from each station individually until a standard of comparison could be formed.

We owe the first series of such observations and an interesting study based thereon to a layman, Mr. W. F. Tyler, whose paper, "A Scheme for the Comparison of Climates," appeared in the *Journal of this Society* in January, 1904. For the benefit of those who may not have read his paper, I may mention that he formed a body of twelve observers in Shanghai, where he was residing, who under as far as possible the same conditions observed the character of the climate at noon each day in August, 1902, and recorded their impressions according to a scale in which 10 represented the climatic character of the worst day the observer ever remembered in Shanghai, hot, damp, and enervating, and 0 represented an ideal summer day in that latitude, bright, brisk and bracing. The mean of the figures of the twelve observers agreed very closely with Mr. Tyler's own, and from these observations, studied in conjunction with the wet and dry bulb thermometer readings, he made certain deductions indicating, as he believes, a clear relation between those readings and the character of the weather each day. On this point I must refer you to the paper, which is in every respect worthy of a careful perusal by all who are interested in climatology. I cannot personally entirely agree with him in his conclusions, and it is greatly to be regretted that no other meteorological observations are given beyond those of temperature and humidity, but the observations are so unique that I have taken the liberty of reproducing them with certain results of my own derived from a study of the figures.

On each of the three diagrams shown I have graphically represented the mean of the observers' figures, and this curve may fairly be taken as a representation of the variation in the weather throughout the month, estimated in terms of bracingness according to the scale. On the first I have also charted

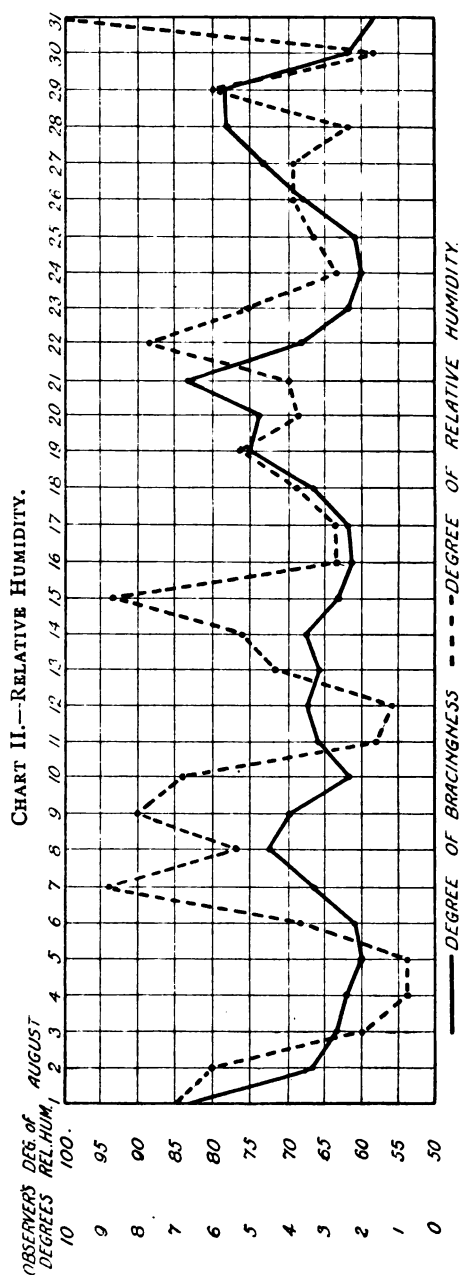




the variations in temperature of both the dry bulb thermometer and the wet bulb. There is no clear relation between the temperature curve and the subjective record beyond a general tendency for a high temperature to coincide with a low degree of bracingness, but one point is conspicuous, namely, that the most bracing day in the opinion of these observers was that when the temperature fell to what must be a low figure for Shanghai in August, namely, 70, and this in spite of the fact that the relative humidity so generally regarded as having an important influence on this character of climate was, as will be seen from the next diagram, 100, a point to which I shall refer again.

On the same diagram I have indicated the wet bulb readings because they are an indication of the influence of evaporation, and probably a more accurate record of subjective temperature than those of the dry bulb. The evaporation of perspiration results in a cooling of the surface of the body which may be considerable, and this is indicated by the wet bulb thermometer, but since the thermometer is sheltered from the influence of winds to which the body may be exposed the subjective sense of temperature may be modified still further. The curve given by these readings, however, shows a much closer relation to the record of bracingness than does that of the dry bulb, and I think that this furnishes important evidence to show that subjective temperature has an important bearing on our estimate of the bracingness of the weather.

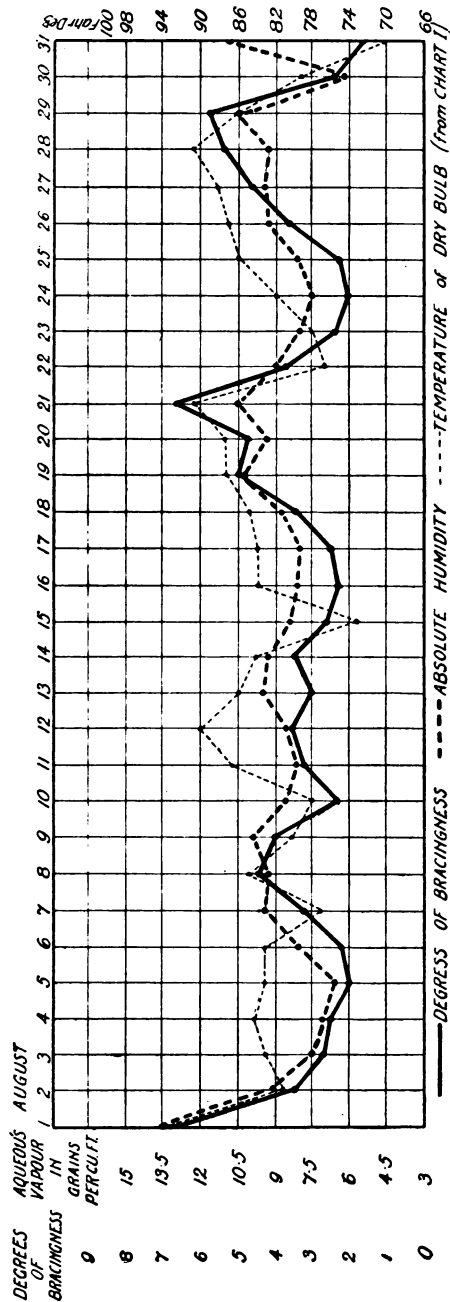
The second diagram represents the relative humidity in relation to the subjective observations, and as will be seen it varies between the wide limits of 54 and 100, while the two curves differ widely in character, especially in the first half of the month, though in the latter half there is a certain tendency for a low relative humidity to accompany a high degree of bracingness, and *vice versa*, which is the relation one would expect to find; but the observations are insufficient in number to justify any definite conclusions in view of the disparities in the earlier records. The difference between the wet and the dry bulbs on which Mr. Tyler bases his calculation gives practically the same curve, but he adopts a different



method, which may be more in accordance with mathematical principles, though the results are not very convincing.

The third diagram gives the variations in absolute humidity, and also the temperature to facilitate reference, and I think you will hardly fail to be struck by the close resemblance of the character of the humidity curve to that of the type of weather as recorded by the observers. This seems to suggest that there must be a close relation between the absolute humidity and the bracing character of a climate, though the influence of temperature on this factor must not be overlooked, a climate of low temperature having necessarily a lower amount of vapour in suspension in the atmosphere than one of higher temperature; but of two climates with approximately the same temperatures there may be a considerable difference in absolute humidity, and in such a case the climate of lower humidity would be found the more bracing. From the same diagram it may be seen that the two days judged to be the most relaxing were those on which the amount of vapour present was the highest, and the temperature also reached its maximum, a result which one would expect; but the relative humidity was 85 on the first and only 75 on the other day. The next conspicuous feature is the one to which I have already referred, namely, the most bracing day of all was the one on which the air was saturated with moisture and the temperature was the lowest, a combination of factors which would lead to a much lower subjective temperature than that recorded by the thermometer, from causes which I shall explain later. On another day (15th) when the temperature was almost as low, the weather was also estimated as very bracing, and on this occasion humidity was again high, namely, 94, but other days were more bracing than this, with a temperature above 82 and low relative and absolute humidity. It would not be justifiable to draw any very definite conclusions from such a short series of observations, but it is evident that in a very hot climate, at any rate, lowness of subjective temperature is a factor which, from the marked contrast which it presents to the prevailing type, interferes with the accuracy of other subjective observations, and it is highly probably that

CHART III.—ABSOLUTE HUMIDITY AND TEMPERATURE.



the occurrence of exactly similar meteorological conditions in this country, for example, would be estimated as relaxing rather than bracing. Another point that is evident is that there must be other important factors going to make up the character of bracingness, if indeed any evidence were required on this point, though Mr. Tyler states that he was unable to discover any relation between these observations and the pressure and prevailing winds, which seems rather remarkable, for these latter are the factors which one would expect to rank next in importance in making up the character of a climate in this respect. One important suggestion, however, he does make, namely, that it is more than probable that the sensation resulting from a combination of a very low atmospheric pressure with considerable moisture and heat cannot be obtained by other conditions of moisture and heat without the low pressure. It may be that in this interaction of three factors lies the explanation of the fact that climates differing in so many respects as do altitude and marine climates may be equally bracing. The difference in barometric pressure is here the most constant, and the chief one from a meteorological point of view, and it is possible that the influence of temperature and humidity on the organism at these different pressures may differ in kind or degree with the result that the combinations of the three may, though each differs from each, give rise to the subjective impressions.

In order to further elucidate the effect of combinations of these climatic factors it is desirable to investigate somewhat closely the manner in which they individually exert their effect on the system. The effect of these factors, and, indeed, of climate as a whole, is primarily upon the skin and the mucous membrane of the respiratory passages. The influence of temperature on the skin has been minutely studied in connection with hydrotherapy, and since the effect of temperature *per se* is the same whatever the means of its application, I have drawn largely from the exhaustive treatise of Baruch on this subject.⁴

Every system in the body is influenced by cutaneous stimuli, but pre-eminently the circulatory and nervous systems,

while the functions of respiration and excretion are in part carried on by this organ, in varying degree according to the needs of the organism and the influence of external factors, and thus climatic effects are both direct and reflex.

The temperature, which has the least perceptible effect on the cutaneous functions, probably varies within wide limits according to the individual and the climate to which he is accustomed, and departure from it in either direction results in irritation and increased function until erythema of one type or another is caused, either burns from too high a temperature or chilblain or frostbite from too low a one. Owing to the existence of a temperature sense the result of thermic irritation differs as the stimulus is one of cold or heat. Gentle stimulation by reduction of temperature enhances the normal tone of the contractile elements of the capillaries, while stimulation by heat is followed by a relaxation of these elements. This stimulation reflexly affects the centres in the cord and medulla, and thus far-reaching effects are set up in the higher nervous centres, and especially on the vaso-motor mechanism. The effect of such cutaneous stimulation of a different kind is seen in a marked degree in the Nauheim treatment, and I think it cannot be denied that air baths, such as are more commonly prescribed on the Continent than in this country, have, by their action on the skin, also a beneficial action on the heart, but the influence of atmospheric stimuli is more closely related to the peripheral circulation, and any benefit the heart may receive is purely secondary, though certain climates undoubtedly have an unfavourable effect in heart disease.

The effect of such nerve irritation is primarily to maintain the tone of the cutaneous vessels, and thus ultimately of the whole systemic circulation, while the reflex constriction or dilatation of the cutaneous vessels results in increased retention or dissipation of heat, and thus is indispensable to the process of heat regulation, since the maintenance of the body temperature at the normal level depends on the equilibrium between heat production and heat loss. Heat loss depends on the conduction and radiation from the skin, and upon the

loss of heat by evaporation where the degree of humidity is such as to facilitate this, that is, when the relative humidity is low, for the conversion of water into vapour is attended with a considerable loss of heat.

When the external temperature is low the peripheral vessels are contracted, their lumina are narrowed and less heat is now lost, and at the same time the blood pressure in the general system is increased, with increased action of the heart and deepening of respiration. A collateral hyperæmia occurs in the underlying parts, which offers a barrier to the further penetration of cold. The splanchnic area dilates, and the blood chilled at the periphery passes in the course of the circulation into this area and is again warmed. The action of the heart being increased more heat is produced by the action of this muscle, and the circulation through other muscles being increased, their heat producing capacity is enhanced, and the exercise to which the body is now stimulated furnishes more heat; this effect is seen in the shivering which results from exposure to cold, by which means considerable heat is produced.

When, on the other hand, the body is exposed to high temperatures the sensory nerve endings transmit the irritation to the medulla and the vascular area of the skin is reflexly increased, while at the same time the splanchnic area is narrowed so that the blood pressure is not unduly lowered. Thus the blood is so distributed as to facilitate heat loss by radiation and conduction, the increased vascularity of the cutaneous structures causes free action of the sweat glands, thus supplying material for evaporation and further heat loss, and the cooled blood circulating reduces the temperature of the internal organs, while muscular exercise is avoided owing to the feeling of lassitude resulting from the heat, and heat production is thus decreased. If exposure to the heat continues or the temperature increases, the cutaneous vessels tend to lose their tone, a congested state of the skin ensues, and the sluggish state of the circulation thus induced may cool the blood in these vessels still further, if free evaporation of perspiration can take place, even though, as may occur in

tropical climates, the temperature of the air is higher than that of the body, so that heat is gained rather than lost by radiation and conduction, but if the humidity is so high as to interfere with the evaporation of perspiration, heatstroke is likely to ensue, a condition which is known to result more readily from hot, moist climates than from any other kind. Any of these results may occur under the influence of climates within the limits of those commonly selected for therapeutic purposes from the Alps on the one hand to the desert climates on the other.

The influence of temperature on the respiratory passages and the lungs varies with the distance from the external air, on the nasal passages it is similar to that on the skin, but is more felt, owing to their greater sensitiveness, and this aids greatly in forming an opinion as to the character of a climate. Abstraction of heat from this source is also greater owing to the vascularity of the mucous membrane, and it is probable that instead of the vessels contracting under the influence of cold they are unaltered or even relax, owing to the necessity of warming the air before it reaches the pulmonary alveoli.

Considering next, humidity, the degree of absolute humidity is, as Sir Herman Weber⁵ points out, of particular importance in regard to the effect of moisture on the lungs. Since air there takes up moisture to the extent of saturation at the temperature of the body, and this moisture-laden air is then expired it is evident that its capacity for moisture, that is, its dryness, depends upon the absolute weight of moisture in the inspired air, whatever its temperature. Air of low absolute humidity must therefore extract more moisture from these mucous membranes, and in doing so will extract more heat, owing to the amount required to vaporise the water given off; this is counterbalanced to some extent by cutaneous action. In cold dry air much heat and moisture is thus abstracted from the lungs, but owing to contraction of cutaneous capillaries and the inactivity of the sweat glands little heat and moisture is lost by evaporation from the skin and less than usual by radiation and conduction. On the other hand, in a hot, dry atmosphere little heat is abstracted from either

source directly, and since the absolute amount of moisture in the air is, despite its low relative humidity, much greater than in a cold climate, less moisture and therefore less heat of evaporation is lost in respiration. There is thus need for loss of heat and moisture in some other way, and this is obtained by the dilatation of the cutaneous capillaries and the free action of the sweat glands, and the amount of water and therefore of heat got rid of is demonstrated by the diminution of the urine. This compensation is less easily accomplished in hot, moist climates, hence their greater oppressiveness. Sudden changes of humidity effect the body very injuriously if it is not in health, owing to their effect on the blood pressure and the extra work they throw on the kidneys, and changes in the relative humidity so slight as 1 per cent. cause perceptible changes in the amount of evaporation from the skin. Air of high relative humidity is a better conductor than dry air, and hence, though loss of heat by evaporation may be diminished, loss by conduction is increased, and this loss is not so readily prevented by clothing, which accounts for damp weather, for instance a thaw, feeling colder than dry weather even of much lower temperature, the subjective sense of temperature being a product of the influence of temperature and humidity as well as of other factors influencing evaporation.

Barometric pressure is in itself a factor of little importance as far as daily variations at any one place go, since equal variations may be experienced in ascending to the upper floors of a modern "skyscraper" without any sensible alteration in the character of the climate, but the larger changes due to an increase in altitude of 1,000 feet or more are of some importance as an indication of the increased rarity of the air, which probably is appreciated subjectively as a sense of increased buoyancy, and especially on account of the influence of this rarified air upon evaporation. As is well known, the decrease of atmospheric pressure increases evaporation; temperature, air movement and humidity remaining the same. Mountain climates, even when they have a higher relative humidity, can, in this respect, be placed on a par with the dry climates of

places at a lower altitude because of the diminished pressure. We may, therefore, perhaps, assume that if seaside climates may, to a great extent, be classified according to their humidity on the score of bracingness, ignoring for the moment other possible factors, mountain climates with higher humidity will be equally bracing or more so, according to the pressure corresponding to their altitude. According to Thomas⁶ damp air and increased pressure give rise to nervous depression, quiet sleep, increased elimination of CO₂, and slower circulation ; dry air and decreased pressure cause nervous excitement, sleeplessness, quickened pulse, drier skin and decreased temperature, the two conditions thus giving results which are precisely those of relaxing and bracing climates in their more extreme degrees.

Movement of air is another very important factor of which, again, subjective observations are more reliable than instrumental ones, even for meteorological purposes. The direct effect is almost solely upon the skin, but important modifying influences are exerted upon temperature and humidity alike. The amount of evaporation and of heat loss by conduction are greatly increased, the degree varying directly with the rapidity with which the air in contact with the body changes, and hence the influence on subjective temperature is great. A low temperature, which is pleasant and bracing when the air is calm, may be almost unendurable if there is much wind, but if the weather is hot and not too moist it is made much pleasanter by wind, which increases evaporation. As a rule climates with considerable air movement are stimulating, while those in which calms prevail are enervating. The importance of wind for ventilation is so obvious as to hardly need mentioning, and just as an ill-ventilated room is the reverse of bracing, so an ill-ventilated place, such as a deep valley shut in on every side, is typically relaxing, and in many respects injurious to health. Beyond this it is difficult to appraise accurately the influence of winds, though their effect on the bodily sensations varies greatly with the point from which they come. Much of this effect depends on the moisture they carry and on their temperature; and from this point of view

the winds from the east should be the more stimulating, being colder and less humid than those from other quarters. But, as Dr. Street⁷ pointed out in his presidential address last session, the wind from a point between north and north-north-west is the most bracing, and although I come from a part of the country differing in almost every respect from his, I quite concur in his observation, and find the point he mentions, namely, that this wind is the one least charged with electrical force, of much interest. We know so little of atmospheric electricity, however, that we can hardly take it into our calculations, though I may call attention to the fact that immediately before a thunderstorm, when the atmosphere is presumably saturated with electricity, the oppressiveness of the air is proverbial.

The influence of sunshine cannot be neglected in a study of climate, it is closely connected with the factors of temperature and humidity, but has also other important influences. Apart from being the source of heat and an important factor in evaporation and therefore in humidity, it is itself influenced by humidity to a great extent. Were there no vapour present the air would be completely diathermic, and the degree of diathermancy depends upon the amount of aqueous vapour present and not upon the relative humidity. Vapour retains the heat reflected from the earth while repelling sunlight, being much less diathermic to dark heat rays than to light rays, which furnishes another reason why moist climates tend to be relaxing and even oppressive—climates, that is, of high absolute humidity, while those of low absolute humidity, such, for instance, as that of the Engadine, are highly diathermic and pre-eminently stimulating. Beyond these close relations of sunlight to other climatic factors there are the important ones of germicidal effect and increased oxidation, and we must not overlook the importance of the exhilaration, probably to a great extent psychical, which bright sunshine gives rise to.

From the point of view of the medical climatologist these are the chief factors of climate, though the rainfall may also be taken into consideration, since its purifying influence cannot be overestimated, and it is a common experience with most

people that rainy weather is more invigorating than dry. It is practically without influence on humidity, at any rate in the direction of increasing it, but Sir Herman Weber⁸ states that it tends to diminish the relative humidity. Its only drawback so long as there is free subsoil drainage is that, when excessive, it may interfere with open-air exercise.

In this brief analysis of the subjective effects of climatic factors I have left much untouched, and may not have said much that is original. My aim has been to stimulate interest in clinical climatology, and to carry perhaps a step further the scheme so ably propounded by Mr. Tyler. I hope that the matter will be taken up by many Fellows of this Society, and I am convinced that when once our English climates have thus been thoroughly studied, we shall find that their virtues are far greater than has hitherto been realised, and that a large percentage of those patients who are now sent abroad might do better in this country. I cannot do better than quote from Weber and Foster on this point :⁹ "A climate with constant moderate variations in its principal factors is the best for the maintenance of health. Such are the climates of England all the year round, and they belong to the most health-giving in the world, and are the most conducive to longevity. They are not, it is true, the most agreeable or stimulating, but the brightest and most exhilarating such as Egypt, Spain, Italy, Greece, &c., are not the best for health and longevity, and are in many respects absolutely inferior to those of England."

To found a study of medical climatology on the lines indicated by Mr. Tyler would be an object well worthy of the attention of this Society. At first the observations from each station would have to be kept separate, since they would only be comparable with the records from the same station until a sufficient number had been made to justify an attempt, by a suitable committee, to combine them, and to extract a series of means or standards from which variations in the direction of bracingness on the one hand, and relaxingness on the other, might be recorded.

With this end in view, I would suggest that the Society should take the following steps :—

(1) To get into touch with the municipal authorities at various stations, especially, but not exclusively, health resorts. Such a connection, firmly established, would, I believe, be productive of good in many directions, but I must confine my remarks to the present subject. They should then suggest that certain meteorological observations, to be specified, should be taken, independently of those required by the Meteorological Society, at a fixed hour, say, 1.30 p.m., and should be taken from instruments fixed in such a position as to give a true index of the climate as a whole, and not, as in a station I know of, where the sunshine recorder appears to be placed in a spot which is the last to be reached by the sun's rays in the morning and the first to be left in the afternoon, while the hygrometers are placed, to all intents and purposes, in a shrubbery, and the anemometer is sheltered by trees and a large building.

(2) To appoint local committees, preferably of members of this Society, to record subjective impressions and clinical records of climate.

(3) The combined records having been satisfactorily established, should be regularly published in the Journal, and, in due time, considered by a committee of the Society for the purposes which I have already described.

REFERENCES.

- ¹ JOURNAL OF BALNEOLOGY AND CLIMATOLOGY, vol. viii., p. 146.
- ² *Ibid.*, vol. viii., p. 34.
- ³ *Scientific Record* for 1883, p. 491.
- ⁴ "The Principles and Practice of Hydrotherapy." 1900.
- ⁵ Von Ziemssen's "Handbook of General Therapeutics." 1885, vol. iv.
- ⁶ *Beitrage zur Allgemeine Klimatologie.* Erlangen, 1872.
- ⁷ JOURNAL OF BALNEOLOGY AND CLIMATOLOGY, vol. viii., p. 12.
- ⁸ Von Ziemssen's "Handbook of General Therapeutics." 1885, vol. iv., p. 33.
- ⁹ Allbutt's "System of Medicine," vol. i., Art. "Climatology."

DISCUSSION.

Dr. LEONARD WILLIAMS expressed his great interest in the paper, which was of a type only too rare at the Society. Dr. Buckley had done both himself and the Society a service in treating the subject so fully and scientifically. The paper had been based largely upon the work of a Mr. Tyler, a layman,

whose contribution was published in the January issue of last year. He (Dr. Williams) had several conversations with Mr. Tyler on the subject, and as to how he came to evolve the system, which he suggested seemed to contain something like the germs of a revolution in climatology. Mr. Tyler's first attempts were on the lines laid down by Professor Abbé, *i.e.*, having adjectives to express the character and degree of the subjective feelings. He had organised a knot of a dozen observers, whom he requested to note at a particular hour of certain days the sensations they experienced as the result of the weather, but he found the adjectival method was impossible; the adjectives became so sulphurous and unparliamentary in the reports sent in that it was evident the plan must be superseded by something more scientific. Therefore he invented the scale of 1 to 10, and that scale seemed to him (Dr. Williams) as good as any other. The way in which Dr. Buckley had taken his hearers through the various elements which went to compose climate, and the effects which they exercised in combination, was very interesting, and opened up quite a large field for investigation. He had for some time protested against what Dr. Buckley also objected to in his paper, namely, the time of day at which meteorological observations were taken in this country. Nine o'clock in the morning was a ridiculous time at which to take observations on humidity. What was required was knowledge of the relative humidity of the atmosphere at a time when invalids were likely to be about, say from 11 to 4. The humidity at 9 a.m. was of no more use to physicians than that at 3 a.m. Meteorologists had simply got into the groove of taking observations at that hour, and, in spite of protests, they continued to do so. It would be valuable to climatologists if the hour could be altered to 12 noon. He would certainly do his best to further Dr. Buckley's scheme, including tabulation of the results.

He was inclined to quarrel with one of Dr. Buckley's suggestions, *viz.*, that observers should be asked to record their subjective sensations at 1.30 p.m. He thought that observers were likely to be influenced at that hour less by climatic

considerations than by dietetic considerations. A man who had just lunched, not wisely, but too well, might take quite a sunny view of an exceedingly relaxing and unpleasant day, whereas a man who had had a bad luncheon would hold quite a different view of the matter. He thought all observations should, as far as possible, be taken fasting.

Dr. WALTERS (Crooksbury Sanatorium) said he was extremely interested in Dr. Buckley's paper, and he was glad to hear his plea for a subjective analysis of the weather. He had himself made an analysis, which might prove of interest to members. He had long been convinced that the ordinary meteorological observation with regard to rainfall, and even the number of hours of bright sunshine, was not an index of the climatic value of a particular place for a certain set of invalids. No doubt those observations had their use, but if they could be corrected in other ways their value would be increased. He had been keeping moderately accurate notes of the weather and various climatological factors at Crooksbury Ridges, and there was a very marked disparity, as one would expect, between the number of wet days and the amount of rainfall. There was also a marked disparity between the rainfall, the number of sunny days, and the number of fine days, and those were points of great importance to invalids. A very interesting paper was written a good many years ago by Mr. Wagstaffe, on the subject of "The Invalid's Day," and it was published in the *St. Thomas's Hospital Reports*. The author urged that the most important points in the weather, to medical men and their patients, were not the weather at a certain fixed point at 9 o'clock in the morning and 9 o'clock at night, but between those times, or, more exactly, at hours when invalids were likely to be abroad. Mr. Wagstaffe's observations were made at Sevenoaks (where he lived) for several years.

With regard to the Crooksbury Ridges results, he (Dr. Walters) had tabulated them during January, February and March, 1902, 1903 and 1904. The rainfall was progressive during those three years. Roughly, there was 4 inches in the first year, $7\frac{1}{4}$ inches in the second year, and $9\frac{1}{4}$ in the third

period. Comparing those with the number of wet days according to meteorological methods, all days on which $\frac{1}{100}$ inch or more was to be found in the rain-gauges, the results did not quite correspond, although they also were progressive. There were 28 such days in the first year, 36 in the second, and 51 in the third. He had also tried to estimate the amount of fine weather and the amount of sunny weather. It was necessarily an imperfect system, but it was as near as he could record it, *i.e.*, the predominant character of mornings and afternoons respectively, right through these periods under observation. The results were, that in the first period there were $65\frac{1}{2}$ fine days—he had not descended to less than $\frac{1}{4}$ days in his estimate—62 in the second period, and 64 in the third. So that, notwithstanding the differences in the rainfall, the number of fine days was roughly comparable, and that one might expect at that place, judging by the average of the three years, 64 or so days of fine weather out of the 90 or 91. He had also tried to estimate the number of sunny mornings and afternoons in the same way; and there, likewise, the results were fairly close. In the first year there were $35\frac{1}{2}$ days, in the second $37\frac{1}{2}$, and in the third period of three months, 37 days. It was of interest to notice that those characters were so near together in the three years, notwithstanding that the rainfall was so different. It had probably been noticed that in most of the situations in Great Britain, comparing a very rainy year with the year after, the number of rainy days was not very different, although the actual rainfall was a very different matter indeed. At Crooksbury Ridges the average rainfall had ranged from 24 to something over 40 inches; last year it was $26\frac{3}{4}$. Perhaps he ought not to base much on those observations, but he thought they showed the value of records of predominating weather in various places. With a little encouragement he thought Dr. Buckley's suggestions could be carried out, and it would constitute a very useful guide for the sake of invalids, as indicating how many hours they could reasonably be abroad, with comfort and benefit.

Dr. BAGSHAWE (Hastings) said in his town there was no longer a society for the study of meteorological data, that was

left to the official reporter for the borough, but the observations which had been brought before the meeting were of great interest. The value of the element of wind in climate could not be overestimated. Dr. Buckley had rightly said that the relaxing climates were often those at places situated in hollows. At the seaside, however, the reverse was the case, *i.e.*, more bracing weather, a large factor being the force of the wind and free ventilation. He quite agreed that the old-fashioned method of taking the readings morning and night were of comparatively little value, and he hoped midday observations would be insisted upon in future. It was well worth while to push the matter further.

The CHAIRMAN expressed the opinion that no good meteorological observations would be made unless societies were established in the climatic resorts.

It was wrong to record the humidity at 9 in the morning alone; they required information taken while patients were out of doors.

Many people said that a climate must be a good one, because the variation in temperature between day and night was so small. It was a most fallacious statement. Of course, such a climate was good for some diseases, but for most patients the best climates were those showing a considerable difference between day and night temperatures. He did not believe a proper estimate of climate could be formed by merely looking over the meteorological records.

In the name of the Society he congratulated Dr. Buckley on his paper, and hoped he would at a future time give a further contribution on the same subject.

Dr. F. PARKES WEBER regretted he had not heard all Dr. Buckley's paper, but judging by the discussion, the great point raised was the estimation of climates by the feelings of individual persons. He had read the paper of Mr. Tyler, to which reference had been made. Though the paper was suggestive, he thought it would be many years before anything in the least trustworthy could be discovered by that method, so great were the fallacies. Everybody must have met persons who estimated muggy days according to their own condition

at the time ; and it was not uncommon for one man to say the weather was relaxing, and for somebody else at the same time to say it was just pleasant. The state of the digestive system seemed to exercise an influence on the opinion expressed. In fact, although the state of the weather did undoubtedly influence one's subjective condition, some persons were much more readily thus affected than others, and there was a general tendency, in England at all events, to make the weather responsible for almost all unpleasant sensations of lassitude, depression, dull headaches, &c. Moreover, to get a reliable average of observations the number of persons engaged would have to be large. He understood Dr. Buckley alluded to the absolute humidity of the air as being very important. He (Dr. Weber) thought more statistics on that might be obtained, and more value placed upon it than upon relative humidity. It was obvious that when one breathed in air at a low temperature, and it was warmed up in the respiratory passages, its relative humidity became exceedingly low, or rather would become exceedingly low, were it not immediately saturated with aqueous vapour from the body. Thus, the effect in this respect on the organism, of being in a warm or in a cold place was enormous. Medical men should ask that more attention should be given by those in observatories to readings which were of value to invalids.

Dr. TYSON (Folkestone) said he was often asked by patients where he could send them so that they would be warmer than the town they lived in. He believed he had sent people to every health resort in England, but with the greatest disappointment. One read advertisements, or even papers by medical men, that certain towns had great advantages over other towns. He was much struck by a notice he received about Penzance, and therefore spent a week there ; he had also sent a patient there. That week was about as cold as any he had spent on holiday. One of the most difficult points to decide was, were any towns in England sufficiently better than others to justify sending patients to them in preference to their staying in their own towns, *i.e.*, such towns as Folkestone, Eastbourne, Hastings, and Bourne-

mouth. It seemed to him that the scientific explanations given by specialists did not help much in that respect. If a patient were sent to a place in which he felt no better, the physician would probably be blamed for money being spent to no purpose. There was some benefit in sending a patient abroad during February and March, because one could rely on a much warmer climate, though whether it was in every way beneficial was another matter.

Dr. WM. EWART said members had been very much entertained by the accounts of climate from the West, and by the apology tendered to the old-fashioned climate of London. London was a snug place compared with many others. When one went into the country to stay with friends one found the beauties of the climate modified by the chilliness, not of the reception, but of the reception rooms and the whole place. The London resident was spoilt by the easy conditions, the warmth, the wood pavement, the Central Railway, and other things which softened the climatic asperities. Another important point was that London was now drier than formerly, and therefore better for rheumatism, except in the immediate neighbourhood of the parks. The climate of many places in England was lovely, and no doubt registered well in regard to temperature, and was well advertised by a luxuriant vegetation, but it was conceivable that plants and flowers might flourish in conditions not very suitable to the invalid. The question of the moisture or dryness of a climate was very important—was it great, or moderate, or very small? He thought many patients required a drier climate than could be found for them in England, and some required the shelter afforded by the higher valleys in protected districts of the Alpine altitudes.

Dr. CLIPPINGDALE asked whether Dr. Buckley had made observations on the foreign bodies in the air, such as salt and carbon. Dr. Buckley, supporting Dr. Street, said the most bracing air reaching this country was from the west, whereas one always understood that it was from the north-east. He took it the difference was that the north east air was laden with salt, whereas the north-west dropped its salt when coming

on to the land. It would be interesting to know whether Dr. Buckley intended to study the effect of the carbon in the air on climate. In the case of fogs there was no doubt an upper stratum of air heavier than that in immediate contact with the surface of the earth, which prevented the smoke rising and disappearing. Evelyn, the diarist, wrote a book on the smoke in London, and it was dedicated to King Charles II., in the usual fulsome manner of the time. He told the King that he and other citizens went abroad in St. James's Park, but that on account of the dense air arising from the grass they were unable to see His Majesty's handsome face. The amount of water in a town, of course, had a great influence on the humidity of the place and the density of the air. Dr. Ewart had spoken of London as a health resort, and the London members of the Society would keep their eyes upon the scheme for putting a dam across the river at Gravesend, by which he thought the amount of fog would be increased. The promoters, who were entirely actuated by mercenary motives, appealed to others, whose ideas were more æsthetic, by saying how nice it would be, instead of speaking of London on a river, to refer to it as "London on the lake." But he believed the lower parts of London near the river were already flooded, so that if the scheme were carried out it would be more correct to speak of "London on the dam."

Dr. BUCKLEY (Buxton), in reply, thanked the members for their kind reception of his paper. He was conscious that it left much unsaid and a good deal unexplained. In its original form it touched most of the points which had been raised, but if he had left it so it would have occupied too long. The point he tried to establish was that subjective observations of climate were more reliable than any others from the point of view of the patient, and that it was the duty of the Society to study those more than the meteorological records. He agreed with Dr. Leonard Williams that 12 would be a better hour for the observations than 1.30. The disparity between the amount of rainfall and the number of rainy days was an interesting point. In preparing a previous paper he (Dr. Buckley) found the record in Buxton for the decade 1881 to 1890 showed 40·31 inches of

rainfall, the number of rainy days being 196. He looked for places with a similar number of rainy days, and found Blackpool and Scarborough had approximately the same, 194 and 197; whereas the rainfall was 27·5 inches for Scarborough and 34 for Blackpool. That raised the question as to the number of rainy days when invalids were prevented from taking open-air exercise; in Buxton these were, he believed, very few. He had something against Dr. Leonard Williams, who, in a previous paper, said that no place having a rainfall of more than 40 inches deserved to be called a health resort.

Dr. LEONARD WILLIAMS said he was referring to winter health resorts.

Dr. BUCKLEY (continuing) referred to Dr. Bagshawe's remark as to borough records being taken officially, and said his point was that in different places—not necessarily health resorts—the Society should form committees of its members to study the climate from a clinical standpoint. The results would tend to vary according to the observer, but the average would probably be about right. Mr. Tyler found the average reports of his twelve observers about agreed with his own. In its original form, his (Dr. Buckley's) paper criticised the variations between the figures of individual observers, and suggested that their condition of health might explain the differences, but when looking at the mean of the observations he found them to be much more valuable than they at first appeared. He agreed with Dr. Snow that a climate which showed but little variation in temperature was not necessarily a suitable climate for invalids. He had referred briefly to that point in his paper in quoting from the article in Allbutt's "System of Medicine," that a climate with a constant moderate variation in its principal factors was the best for the maintenance of health. He did not think the fallacies from his suggested system would be anything like so great as when dealing with meteorological records, and especially isolated ones, as published in papers. It seemed impossible to bring the temperature and sunshine records into accord with the facts as generally understood. The Riviera was considered to be a warm and pleasant place for invalids, but he could understand such, during the last few weeks, being glad to get back home. In a previous winter

a patient came from Davos and said he was glad to be in Buxton again, as the weather there was superior. He thought the reason Londoners found Ilfracombe so much colder than London, although the record showed its temperature to be higher, was because the temperature recorded was the dry-bulb temperature. Ilfracombe was a place of high humidity, and humidity was a very important factor in the subjective sensation of temperature. He did not think the body could estimate accurately the dry-bulb temperature, but with a little practice one could come somewhere near the wet-bulb temperature, simply because the wind and humidity were taken into consideration. Dr. Clippingdale had remarked about salt and carbon in the air. In Buxton one did not reckon to have carbon ; so he must leave that point to Londoners. He did not agree that the north-east wind was more bracing than the north-west, though it was colder, giving a sense of lower subjective temperature. In any country with a high normal temperature, a fall in subjective temperature, even accompanied with saturated air, would give rise to a sense of bracing, though the meteorological records would not give that impression. In reference to salt, the north-east wind had covered a good deal of ground by the time it reached Buxton, while the north-west came fairly directly from the sea ; if the wind were south it brought a kind of Scotch mist. Dr. Street, in his paper, mentioned that the north-west wind was the most bracing. In Westgate the north-east wind would bring as much salt as the north-west. There were other points upon which he might have something to say on a subsequent occasion, as he had taken very wide records, and had studied those published in the last twenty-five years, but they were somewhat lacking in detail. He thought members should take it into their hands to make the study of English climate a more real thing than it had hitherto been. The Royal Medico-Chirurgical Society had spent many years in producing books which were standard works on the climates of Great Britain, and it should be the province of the Climatological Society, which he regarded as the child of the Royal Medico-Chirurgical Society, to carry the work further, and place the study of clinical climatology upon a more satisfactory basis.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

COPY OF MINUTES.

ORDINARY Meeting held at 20, Hanover Square, W., on Thursday, December 8, 1904, at 5 p.m. The President, Dr. BOWEN DAVIES (Llandrindod Wells), in the chair.

The Minutes of the last meeting were read and confirmed.

The following candidates were elected Fellows of the Society :—

Henry J. Johnston-Lavis, M.D., D.Ch., M.R.C.S., Beaulieu, Alpes Maritimes.

Edward Gibson Moon, M.R.C.S., L.R.C.P., Broadstairs.

Charles John Stansby, M.D., M.R.C.S., L.R.C.P., London.

W. Ringrose Gore, M.B., B.Ch., Llandrindod Wells.

Thomas Dixon Savill, M.D., London.

Frank Brightman, M.R.C.S., L.R.C.P., Broadstairs.

Alfred Mantle, M.D. Durh., M.R.C.P., Halifax and Harrogate.

Dr. N. HAY FORBES (Tunbridge Wells) read a paper entitled "Observations on the Climate and Health Resorts of Scotland."

The following Fellows took part in the discussion: Drs. FORTESCUE FOX, LEONARD WILLIAMS, SYMES THOMPSON, WARD-HUMPHREYS, BLACK JONES (Llangammarch), MOXON (Matlock), SOLLY (Harrogate).

Dr. HAY FORBES replied.

COPY OF MINUTES.

ORDINARY Meeting held at 20, Hanover Square, W., on Wednesday, January 18, 1905, at 5.30 p.m. Dr. W. V. SNOW (Bournemouth) in the chair.

The Minutes of the last meeting were read and confirmed.

Dr. CHAS. W. BUCKLEY (Buxton) read a paper entitled "Climatology from a Medical Standpoint."

The following Fellows took part in the discussion : Drs. SNOW, LEONARD WILLIAMS, R. WALTERS (Crooksbury), BAGSHAWE (St. Leonards), PARKES WEBER, TYSON, J. T. GARDNER, WM. EWART, S. D. CLIPPINGDALE.

Dr. BUCKLEY replied.

The following candidates were ballotted for and elected :—

John Murray, M B., C.M., Llandrindod Wells.

George Beckett Batten, M.D Edin., C.M., London.



Reviews and Notices of Books.

SOME METHODS OF HYPODERMIC MEDICATION IN THE TREATMENT OF INOPERABLE CANCER. By John A. Shaw-Mackenzie, M.D. (London: Baillière, Tindall and Cox, 1904.)

This pamphlet is an amplification of a paper which appeared in the *Journal of the Royal Army Medical Corps*, July, 1904, by Colonel T. Ligertwood, C.B., M.D., and the author of the *brochure* before us. It strongly advocates the treatment of inoperable cancer by the hypodermic injection of Chian turpentine. This drug was originally introduced by Professor Clay, of Birmingham, about twenty-five years ago, at which time its administration by the mouth was impartially and enthusiastically tried. The results, however, were not altogether satisfactory, and it soon fell into disuse. As a subcutaneous injection it seems to possess a greater value and to present fewer drawbacks than when given by the mouth. These injections are administered deeply into the subcutaneous tissue, preferably the buttock. The initial dose is 5 minims of a 20 per cent. combination of Chian turpentine with olive oil, and the amount is gradually increased up to 60 minims. Injections are made on every alternate day. There is no necessity for the patient to remain in bed, and he is able in most cases to follow his ordinary employment.

The author relates two cases in which this method seemed to be successful, not, it is true, in curing the cancer, but in affording a measure of relief which surpassed anything which had up to that time been tried. Encouraged by these results, an investigation was made as to the value of the treatment associated with the name of Mr. J. H. Webb, of Melbourne, who has for some time been advocating the relief of cancer by hypodermic injections of soap solution. So far as the few cases recorded may be taken as guides, this investigation goes to show that Mr. Webb's claims are by no means exaggerated, and that his methods deserve a more extended trial. Dr. Shaw-Mackenzie gives careful directions as to the *technique* of these methods, and some useful hints as to the cases in which they may be employed with hopefulness. A perusal of the histories which he gives of these cases is very convincing as to the advantages which patients may derive in the last stages of cancer, both from the Chian turpentine method and from the soap solution method. These methods are evidently worthy of more extended trial, and with a view of helping to shed

further light upon this dark continent of medical science, those who have suitable cases under their care would do well to read Dr. Shaw-Mackenzie's admirably expressed and most suggestive little pamphlet.

THE "NAUHEIM" TREATMENT OF CHRONIC DISEASES OF THE HEART. By Leslie Thorne Thorne, M.D., B.S.Durham, M.R.C.S.Eng., L.R.C.P.Lond. (London: Baillière, Tindall and Cox, 1904.)

This is a very practical little work, containing the essentials of what is now generally known as the Nauheim treatment of chronic diseases of the heart. The general principles which govern this treatment are well known to all those engaged in health resort practice, but the *technique* is not familiar to many who might profitably advise this treatment to their patients; and it is the ignorance of the *technique* which rightly prevents them from advising a course with which they are not thoroughly familiar. A perusal of this little book will instruct anybody in a very short space of time, not only as to the treatment itself, but also as to the cases which are suitable and those which are not. In our judgment, the Nauheim treatment offers a means of combating chronic disease of the heart which, in suitably selected cases, is superior to any other. Such mistakes as the subjecting of a patient to effervescing baths and exercises in the stage of broken compensation are not likely to occur in the practice of those who have given themselves the trouble of reading Dr. Leslie Thorne Thorne's admirable little *brochure*.

INSANITY IN EVERY-DAY PRACTICE. By E. G. Younger, M.D., M.R.C.P. (London: Baillière, Tindall and Cox, 1904.)

This is No. 8 of Messrs. Baillière, Tindall and Cox's Medical Monograph Series, and it worthily upholds the credit which the profession has learned to attach to the series. Insanity is a subject with which the ordinary medical practitioner is but partially acquainted, and nothing is more baffling to the recently qualified man than to be brought suddenly face to face with a case of mental aberration. He is probably quite ignorant of his powers and duties in the presence of such an emergency, and this ignorance is liable to cost him some prestige amongst the friends of the patient. The possession of, and occasional reference to, Dr. Younger's book would save such an one a great deal of unnecessary anxiety and worry, and would enable him to speak with confidence and authority when called upon to deal with a case of this sort.

The two chapters on "The Examination of the Patient" and the "Legal Bearings" are excellent in their simplicity and helpfulness, and would of themselves render the book a valuable possession to a general practitioner. The second

part deals with the types of insanity and its special forms, and does so in a manner which is terse and lucid. The editor is to be congratulated on having secured a contributor to the series who is not only thoroughly at home in his subject, but who seems to have ever before him the difficulties of those less experienced than himself.

THE EFFECTS OF TROPICAL LIGHT ON WHITE MEN. By Major Charles E. Woodruff, A.M., M.D. (London: Rebman Ltd., 1905.)

This book is the outcome of an investigation undertaken by the author as to the soundness of the theory announced by von Schmædel, that the skin pigmentation of man was evolved for the purpose of excluding the actinic or short rays of light which destroy living protoplasm.

The investigation is undertaken from an entirely impartial and scientific standpoint, and the result is eminently satisfactory. In addition to the conclusions at which he arrives as to the effect of tropical light, the author touches upon various subjects, such as the therapeutic effects of light as applied by the Röntgen, the Finsen, and other artificial rays in a manner which is exceedingly interesting and instructive. The important question of the possibility of climatising the white man in the Tropics is one which concerns Englishmen very closely, and the effect of a general perusal of this book would be to give pause to the rampant and indiscriminating imperialism which would seek to "dump" the white man in every quarter of the globe. Englishmen are no more fit for really tropical zones than are the inhabitants of the Tropics suited to our northern winters. The reasons for the differences in their physical peculiarities between the inhabitants of the zones are dealt with in an exceedingly interesting manner, and should be sufficient to carry conviction to the minds even of those who seem to have elevated it into an article of faith that tropical diseases constitute the only stumbling block in the way of a general preponderance of white men in tropical climates.

The book closes with a chapter on practical rules for white men to observe in the Tropics, and if only for this chapter the work should be consulted by everyone who is likely himself to go to the Tropics, or who is liable to have the responsibility of advising those who do.

HOW TO KEEP WELL. By Floyd M. Crandall, M.D. (London: Grant Richards, 1904.)

This is a book written by an American physician for the instruction of the public. For reasons into which it is unnecessary to enter, such books are, as a rule, open to some objection, but this one is altogether free from any of the reproaches which usually attach to the class. It contains

knowledge which is eminently desirable that the public should be familiar with, but which, curiously enough, is by no means accessible to it, at any rate, in a compact form. All medical men will recognise in this volume things which, though axiomatic to themselves, are ignored by their patients until some illness or accident focusses attention upon them. The general conception given in the book of the stage to which modern medicine has advanced is quite satisfactory, and the information is afforded in a form which is readily to be understood by the ordinary educated individual. The sections concerning children are particularly valuable, and there would be less concern as to the physical deterioration of the race, not only in England and America, but all over the world, if the sound common-sense which Dr. Floyd Crandall brings to the consideration of the subject were more generally diffused throughout the nations.

Equally valuable are the sections dealing with sedentary life and advancing age, and here, as indeed elsewhere, the qualified medical man may obtain a great deal of help in the advice which he should give to patients who are necessarily ignorant of the physiology of diet and the general hygiene of different phases of life. The book is one which should be read not only by all medical men, but it is one which might profitably find a place in the libraries of all educated people.

CLIMATE AND HEALTH IN HOT COUNTRIES. By Lieut.-Col. G. M. Giles, M.B., F.R.C.S. (London : John Bale, Sons and Daniels-son, Ltd., 1904.)

The writer of this work, who is an acknowledged authority on all questions concerning tropical health, has, in the present volume, succeeded in putting into a popular form information of the utmost moment to those who are thinking of going to any portion of the Tropics.

The book is divided into two parts. The first concerns itself with the general hygiene to be observed in hot climates, and the second contains an outline of tropical climatology. The latter portion is, of course, rather technical for the lay reader, but to the expert it is interesting and suggestive in the highest degree. Certainly no one who is desirous of acquainting himself with the characteristics of India, China, Egypt and the West Indies could find a more reliable and experienced guide than Colonel Giles has proved himself to be, not on this occasion only.

Of the first portion of the book one may say at once that it breathes sound common-sense from beginning to end. The question of clothing is one which is too often approached from the point of view of mere rule of thumb, and it is refreshing to find that Colonel Giles shakes himself free from the sense-

less and deleterious fallacy that the only road to physical salvation is that which is strewn with blankets and Jaeger underwear. The whole of this section is exceedingly interesting, and would well repay perusal, even by those whose only experience of tropical weather is gained from London in August.

The chapter on water and food is also excellent, and brings home the necessity for the European in hot countries to adapt his dietary, as far as possible, to the custom of the natives. Of more than usual interest and excellence is the fifth chapter on the management of children in hot climates. People are too apt to forget that the English child in the Tropics labours under the grave disadvantage of being a species of fish out of water, in that his natural defences are necessarily those against cold rather than against heat, and he has consequently to develop his heat-resisting powers under circumstances which are by no means favourable. The way of combating these drawbacks and the other dangers to be avoided in the rearing of children are well and succinctly set forth. The rest of the first part is taken up with the consideration of malaria and other tropical diseases, and here, too, we find the author speaking as one having authority on matters where ignorance rather than knowledge is the prevailing note.

Familiarity with the matters contained in this book will be of the utmost value to any medical man, especially to one who is called upon to deal either with people going to the Tropics or those who have suffered from residence therein.

AN ATLAS OF DERMATOLOGY: showing the appearances, Clinical and Microscopical, Normal and Abnormal, of Conditions of the Skin. By Morgan Dockrell, M.A., M.D., Senior Physician and Chesterfield Lecturer on Dermatology to St. John's Hospital for Diseases of the Skin. (London: Longmans, Green and Co., 1905.)

It seems quite a short time since the aid of histology was first called in to evolve order out of the chaos which had gathered round dermatological classification and dermatological nomenclature, and yet the difference which the use of the microscope has made is sufficient to mark an era as great almost as that which was brought about in ophthalmology by the introduction of the ophthalmoscope. No clinical diagnosis of a cutaneous disorder is nowadays considered complete without histological confirmation, and no conception of a skin affection can be regarded as satisfactory unless its naked-eye appearance is associated in the mind of the observer with its microscopical presentment. The study of dermatology is the education of the eye, but the eye must be trained to see not only the obvious departure from the normal, but to picture

also the underlying pathological condition by which this departure is brought about.

There have in the past been many excellent atlases which have reproduced most graphically the naked-eye appearances of various skin diseases, but the one before us is the first which has placed these appearances side by side with their scientifically related histological sections. To the latter-day student of dermatology, therefore, the principle of this atlas will appeal with a force which is quite unconnected with such intrinsic merits as it may possess. Dermatology and histo-pathology are henceforth one and indivisible, and a work which is the first to give unqualified recognition to this important and abiding fact will be welcomed by all true scientists.

Nor are the intrinsic merits by any means hard to find. The foolscap size is exceedingly convenient, and the bulk of the volume is comparatively insignificant. Without borrowing the eulogistic superlatives to which latter-day art criticism has given currency, it seems difficult to do justice to the excellence of the plates. They could not in our judgment be improved upon in any particular. They represent the high-water mark, not only of artistic skill, but also of accurate reproduction, and they reflect the utmost credit upon all concerned. Each disease is represented by the coloured portrait of an actual patient, and in connection therewith is shown a section taken from the most characteristic portion of the eruption. Neither the scheme itself nor the method of its accomplishment seems to us to leave anything to criticise. To say that the descriptive letterpress is equally beyond the range of cavil, would be to invest the work with attributes to which nothing mundane may justly lay claim, but this, at any rate, may conscientiously be said, that both the manner and the matter of the verbal portion is altogether in consonance with the scheme of the book. Very little beyond what is strictly descriptive of the plates is offered, and that little makes the reader rather wish for more. Dr. Dockrell's classifications are in many cases novel, and in some they are even startling in their novelty, but as being all in the direction of simplicity they are sure to meet with general support, and as being based in each instance upon histological foundations, they will provide food for thought even to the most reactionary advocate of the older order.

For those interested in the scientific study of cutaneous disorders a book of this nature has become indispensable, and practitioners no less than students will be grateful to Dr. Dockrell for providing them with a work whose teaching is so lucid and so sound, and which offers them what they require in a form at once so compact, so accessible and so conspicuously meritorious from the artistic standpoint.

THE CHANNELS OF INFECTION IN TUBERCULOSIS. By Hugh Walsham, M.A., M.D., F.R.C.P. (London: John Bale, Sons and Danielsson, Ltd., 1904.)

This is the Weber-Parkes Prize Essay for 1903. From the conditions laid down by the Royal College of Physicians in awarding this prize, the matter of the essay is necessarily very technical. The author has divided his investigations into two portions, the channels of infection, and the conditions, original or acquired, which render the tissues vulnerable. The first portion occupies 116 pages, and is illustrated by some excellent plates, and a good deal of the space is taken up by the accounts of cases to give point to the writer's arguments. The second and shorter portion contains matter of very considerable interest concerning the reasons why some people are more vulnerable than others. The why and the wherefore of attacks of micro-organisms is a question upon which no one can afford to dogmatise. Why vulnerability to one disease should seem to confer protection from others is an interesting point in connection with the matter. What heredity has to say to the question and in how far social and domestic surroundings may be credited with a part in the ultimate result are also matters of the deepest interest. Some of these are touched upon by Dr. Walsham while others are left unconsidered; but the work as a whole is a monument of careful original research and sound deduction from the facts which those researches have elicited.

Notes and News.

THE following letter has already been sent to several prominent Fellows of the Society, but to avoid the task of circularising all, it is reproduced here in the hope that as many as possible will favour the writer with their opinions on the question with which it deals :—

“The suggestion which has emanated from Sir Richard Douglas Powell, as President of the Royal Medical and Chirurgical Society in its centenary year, to the effect that the London Medical Societies should amalgamate to form a new central society under a new name, is one which, as likely to influence the future of our Society, is deserving of the fullest consideration at the hands of our Fellows. So far as the general principles are concerned on which the proposal is based they must be regarded by all practical men as in the highest degree worthy of realisation. To centralise the valuable work which is now being done by the existing societies, to economise the present waste of energy, to save the cost entailed by the multiplication of administrative bodies and the consequent multiplication of subscriptions are all of them objects well worthy of attainment ; and when to these is added the sentimental advantage of the prestige attaching to a body whose destiny it might conceivably be to move in the direction of a Royal Academy of Medicine, everyone will feel that Sir Richard Douglas Powell has done a great service to the profession in making a serious effort to accomplish the scheme.

“Approval of general principles, however, does not necessarily carry with it an agreement with all the details of a complete programme, and it behoves those responsible for the future of societies which might be included in the scheme to ascertain the nature of these details and to submit them to the judgment of their members. In so far as any of these details have at present been worked out, they appear to be

as follows. There is to be one subscription which will cover not only the use of the library, but also the membership of all the amalgamated societies. Each society, or department as it will then be, will within certain wide limits be altogether autonomous, with its own officers and council, and with the right of sending at least one representative to the central governing body. The amount of the subscription does not appear to have been decided, but the sum of three guineas for town members has been suggested, and, I think, one guinea for country members.

"The question as to how the provincial Fellows of the Balneological Society would view the suggestion of the inclusion of the Society in this scheme is a very important one for the members of the Council to ascertain. The London Fellows are likely to be unanimous in its favour, and it would probably appeal very strongly to those country members who belong to more than one London society, but it is very desirable, even at this early stage, to take the opinion of those who do not come under either of these categories.

"Will you, therefore, at your earliest convenience, favour me with your own views on the subject, and do your best to ascertain those of such Fellows of the Society as are accessible to you ?

8, York Street,
Portman Square, W."

LEONARD WILLIAMS.

THE *Société Internationale de la Tuberculose*, the object of which is to study the most efficacious means of defence and treatment for tuberculosis, held its Annual General Meeting in Paris, on March 14, under the presidency of Mr. Richelot, Member of the French Academy of Medicine.

After a discourse by Dr. Samuel Bernheim, in which he clearly set forth the actual state of the question, the Society proceeded to elect its Bureau for 1905-1906, and the following gentlemen were elected members :—

President.—Professor Lancereau, of the French Academy of Medicine, of Paris.

Vice-Presidents.—MM. Huchard, Richelot, S. Bernheim, of Paris ; Professor von Schrötter, of Vienna ; Sir Hermann Weber, of London ; Professor de Lancaster, of Lisbon.

General Secretaries.—M. Georges Petit, of Paris ; Count Ivan Tolniewski, of London.

Treasurer.—M. Papillon, of Paris.

Assistant Treasurer.—M. L. Garnier, of Paris.

Secretaries "de Séance."—MM. Tartiére, Bourdin, Roblot, and Chauveau, of Paris.

Archivist.—M. Ruault, of Paris.

All applications for membership, &c., should be addressed to Dr. Georges Petit, 51, Rue du Rocher, Paris.

VOYAGES D'ÉTUDES MÉDICALES.—We have received from Dr. Carron de la Carrière, 2, Rue Lincoln, Paris, an advanced notice of the programme for 1905, to which we beg to call attention. The voyage this year will include the health resorts in the south-western district, *i.e.*, the region of the Western Pyrenees, which in the opinion of many is the most beautiful in all France. The places to be visited are very important, and include stations of such varied interest as Luchon, Cauterets, Bareges, St. Sauveur and Eaux Bonnes, among the mineral water resorts ; and Pau, Biarritz and Arcachon, among the climatic resorts.

The voyage is to last exactly a fortnight, the *rendez-vous* being on Friday, September 1, and the *dislocation* on Thursday the 14th. The exact price is not yet decided upon ; that will appear with the detailed programme to be published next month, but judging from a previous voyage in the same district, it will not exceed 300 francs, *i.e.* £12. This comparatively small sum includes everything, from the arrival at the *rendez-vous* to the point at which the company breaks up. Nothing has to be paid for, except such things as souvenirs which anyone wishes to purchase. Travelling is by first class special train ; the hotels are the best at each place visited ; the food is excellent, and the facilities for forming an opinion as to localities and therapeutic measures are as good as they can

be. When viewed only from the standpoint of an inexpensive holiday with the best of everything in the way of material comforts thrown in, these trips stand absolutely alone, and when, in addition, there is delightful company and the advantage of increasing one's medical knowledge and broadening one's social outlook, we cannot help feeling surprised that so few members of the profession in this country avail themselves of such excellent opportunities. We trust that this year will see a change in this matter and that a large number of Englishmen will cross the channel to take part in the trip to the beautiful and important district of the Pyrenees.

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WEDNESDAY, MARCH 8, 1905.

THE ETHICS OF HEALTH RESORT PRACTICE.

BY LEONARD WILLIAMS, M.D., M.R.C.P.

Physician to the French Hospital, London.

IN opening this discussion I should like to say at once that the subject to be discussed is not so wide as might seem to be indicated by the title which has been selected for it. The rules of conduct which should guide medical men practising in the same health resort differ in no essential features from those which obtain in other places. These rules have been laid down by several authorities, and their practical application may be found admirably exemplified week by week in the *British Medical Journal*. It could therefore serve no good purpose for this Society to discuss the matter, and as excursions into local questions might easily take a personal turn, I beg that they may be disallowed and that speakers be made to confine their remarks to the rules which should guide health resort practitioners, not in their dealings with one another, but in their dealings with those at a distance who confide patients to their care. This

is a branch of the ethical question which, as presenting special situations, seems to require special rules, and it was with the object of evoking some aid in framing such rules that the Council decided that this discussion should take place. That I was deemed a fitting instrument for the introduction of so delicate and recondite a subject I attribute to the fact that I am a sort of poacher turned gamekeeper, that having practised for some years at a health resort and being now in London, I am in a position to look at the subject from both points of view. Whether such a discipline has endowed me with the virtue of impartiality appeared to me so doubtful that I endeavoured to cultivate it by seeking and studying the opinions of a large number of prominent Fellows of the Society, to whom I am glad of this opportunity for expressing my thanks for much valuable advice and many suggestive hints.

I would begin my contribution to the solution of the problem before us by laying down three axioms, as follows:—

(1) *Salus ægrorum suprema lex.*

(2) The ordinary courtesies which are observed among gentlemen should be more than ever scrupulously observed among those medical men who, having in the welfare of the patient and the dignity of their calling common objects of the highest import, are nevertheless unable to meet for personal discussion.

(3) There should be a clear understanding as to the relative positions of the health resort physician and the physician at a distance who sends the patient.

(1) *Salus ægrorum suprema lex.* — Such is the graceful classical garb in which, when writing to me, Dr. William Ewart clothed the homely formula that in all the dealings between medical men the health of the patient should be the paramount consideration. This is, of course, a first principle, a condition precedent of every rule, and must therefore be taken as implied in all that follows. Upon such a point there can be no differences of opinion and it need not therefore detain us.

(2) *The ordinary courtesies which are observed among*

gentlemen should be more than ever scrupulously observed among those medical men who, having in the welfare of the patient and the dignity of their calling common objects of the highest import, are nevertheless unable to meet for personal discussion.—The practical applicaiton of this formula may be brought under two heads. The first of these concerns the question of correspondence. Medical men as a rule are not eager letter-writers, and it is to their carelessness in this matter that a good many of the difficulties which arise between them are to be attributed. Certainly in connection with the sending of a patient to a health resort, nothing is better calculated to give rise to such difficulties than the neglect of letter-writing, whether this be on the side of the sender or the local practitioner. When sending a patient to a health resort a letter to the selected practitioner, or, if the sender does not care for the responsibility of making a selection, an open letter to any practitioner, should precede or accompany the patient, setting forth the nature of the complaint and giving any details which may assist the receiver to form a correct estimate of the case. This, I say, is the duty of everyone, and he who neglects it offends grossly, not only against the canons of ordinary good behaviour, but he offends also against the primary axiom that the good of the patient shall be the first consideration. A suitable reply to such a letter would obviously engage the prompt attention of any self-respecting receiver, and such a reply ought to contain the assurance that if anything unusual or unforeseen occurs in the course of the treatment the original sender would at once be advised of the occurrence; and it is needless to add, this undertaking should be rigidly adhered to. When the patient has been examined it is wise for the local physician to indicate briefly to the sender the line of treatment which he proposes to adopt. So far the matter would seem to be simple enough. Everyone who advises a patient to go to a health resort ought to write a letter giving the details of the case for the benefit of any local practitioner who is called upon to treat the patient, and such local practitioner should not only reply to the letter, but keep the sender informed

of the progress of events. But if, as too frequently occurs, no letter accompanies the patient, is the local physician to write to anyone, and if so, to whom? This is a question which has been asked more than once, and has been answered in more ways than one; and yet it seems to me that there is only one possible answer to it. Two wrongs do not make a right; and that one man has neglected an obvious duty is not a sufficient reason for another to do the same. The proper course for the local man to adopt in these circumstances appears to me to be as follows. He should ascertain the name of the patient's ordinary adviser and write to him stating the circumstances, whatever they may have been, which led to his being consulted, and indicating briefly what he proposes to do. If the patient has been recommended to the health resort by some one other than the ordinary medical adviser, *i.e.*, by some consultant, such other should also be written to; or, to put the matter briefly, the local physician, in the absence of any definite indication as to whom he should write, should communicate with any medical man who was directly or indirectly responsible for the patient's visit, or who is likely to have any professional interest in the progress of the case. This may sound unduly onerous; but that he should, except in special cases, write to someone seems to me to be abundantly clear, and it is better in such a matter to write too many letters than too few.

The special cases just referred to are those in which the patient requests that no one shall be apprised of his visit. This is a wish which must, of course, be respected, and its expression relieves the local practitioner of any necessity for the correspondence which must under all other circumstances be considered incumbent on him.

The second matter in which the ordinary amenities of civilised intercourse would seem to have a special application to the problem before us is where differences of opinion as to diagnosis or treatment unfortunately arise between the sender of the patient and the spa physician. Such differences are, of course, inevitable, but the difficulties which they present are seldom insuperable, especially in the presence of frankness.

and courtesy. When they arise, the local practitioner instead of implying, or worse still, of baldly proclaiming his disagreement to the patient, should write to the sender temperately stating his views and letting it appear that his sole object is that of arriving at an agreement. When this is done politely and the position adopted is supported by facts, a working agreement is nearly always possible, and however unpromising the circumstances may at first seem, it should be honestly sought for by both parties. In the fortunately few instances where the points of variance prove to be so numerous or so important as to render even a temporary compromise impossible, the position must be explained to the patient or his friends for their decision. For the local man to do, as is too often done, namely, to impress upon the patient that upon some vital point he takes a different view from that of the sender, without first communicating with the latter, is most unwise and discourteous, and cannot be too severely condemned. It shuts the door to any hope of compromise and is, above all things, the best calculated to produce strained relations between the parties.

So much, then, for our second axiom. The principle of it will, I am sure, be generally conceded, and I do not expect that the applications of it which I have ventured to make will excite much controversy.

I now come to the third axiom which, as you see, I have expressed in terms so general that it amounts to no more than a pious opinion. That there should be a clear understanding as to the relative positions of the health resort physician and the sender of the patient is a proposition to which everyone will unhesitatingly subscribe; it is only the clauses of the agreement that are likely to give rise to controversy. These clauses I have reduced to three, which I will submit for your approval when the general questions of which they seek to effect a settlement have been considered.

(3) *That there should be a clear understanding as to the relative positions of the health resort physician and the sender of the patient.*—The absence of a definite understanding lies at the root of a very large proportion of the friction which arises,

and if a satisfactory working formula could be arrived at it is probable that most of the existing difficulties would disappear. Such a working formula is, however, very hard to find. There is, on the one hand, the spa physician who is quite content to regard his relations to the sender as identical with those which properly subsist between a house physician and his chief, who looks upon himself merely as an agent, no part of whose business it is to confirm a diagnosis or approve a line of treatment, and whose highest ambition is to carry out the behests of the sender. There is, on the other hand, the spa physician who regards himself as a consultant, who considers it due to his position to question every diagnosis and modify every treatment, who treats letters and suggestions with lofty unconcern, and whose highest ambition seems to be comprised in declaring himself right and everyone else wrong.

Now where differences such as these exist among those practising, possibly in the same town, it is not surprising that a working formula should be hard to find. The one has too much ego in his cosmos, the other too little. In the hands of the former the interests of the patient are liable to suffer. A line of treatment originally suitable may be rendered unsuitable by developing circumstances, and if persisted in may occasion serious consequences. Yet in the hands of such a man it would be persisted in, and the evil consequences would be most unjustly attributed to the sender, who has every right to expect an intelligent and resourceful supervision of the case ; for your humble practitioner, though he may accept his instructions with becoming modesty and will carefully refrain from saying anything which may be calculated in any degree to undermine the patient's confidence in the sender, is not unlike Uriah Heep in his readiness to turn and rend his benefactor when occasion serves. In fair weather you may almost hear him thus paraphrase the words of his famous prototype : "As a doctor, I am well aware that I am the 'umblest person going, let the other be who he may. My wife is likewise a very 'umble person. We live in an 'umble abode, Mr. Consultant, but have much to be thankful for. My father's former calling was 'umble—he was a general practitioner!" But when things go wrong he shows in his true colours.

Now it is quite obvious that the spa physician, whatever he ought to be, ought certainly not to be even a colourable imitation of such a monster. He ought to be self-respecting and possessed of the confidence which is begotten of knowledge and experience, and should be prepared to contribute, and if need be insist upon, his own views as to the proper management of a case. To work with such a person may at times be gratifying to the vanity of the sender, but his methods redound neither to the advantage of the patient nor to the credit of the profession. We may, therefore, dismiss the suggestion that the attitude of the health resort practitioner towards the sender should be that of a house physician towards his chief. He is not in any sense a subordinate.

Can he, however, on the other hand, be rightly described as a consultant? To answer this question properly it would be necessary to define what is meant by a consultant, but to venture upon such a definition would be to provoke dissent and to run the risk of burying the main question in a side issue. An expert he certainly is, in respect of local conditions and of certain forms of treatment, and an expert he may rightly or wrongly consider himself to be in the diagnosis of certain types of disease. And the more I think about the matter, the more convinced am I that this question of diagnosis constitutes the whole crux of the position. The details of the treatment are of necessity left very largely in the hands of the local man. He is admittedly the best judge of their powers and limitations, and even in the few instances where disagreements upon such a point do arise, the fact that they are seldom communicated to the patient prevents them from being really serious. With the diagnosis, however, it is different. Divergencies of opinion on this point at once make themselves acutely felt. Hereon hang questions of diet, of exercise, of baths and waters, of everything, in fact, which is in any degree germane to the case, and if the local man is at all off-hand in his methods, the patient's confidence in someone immediately becomes seriously undermined. I say "someone" advisedly, because in such a conflict it is not always the local man who wins. From the very fact that they have gone to a particular

place for a particular line of treatment, patients display a large faith in the person who has sent them there, and that faith is often proof against the shock of doubts and wonders expressed by the local man—in full possession of the field though he be. For the diagnosis, unlike the details of treatment, has already been settled before the patient is recommended to the spa ; very few physicians will advise people to face the expense and general upheaval which a visit to a health resort may entail, until they feel moderately certain of the sufficiency of the grounds for such advice. The recommendation of a health resort is, in fact, very seldom made until the case has been under observation for a sufficient time for the recommender to be quite sure of his facts, and until he has exhausted such therapeutic resources as lie closer to his hand. What, then, is such an one to think of his *confrère* at the spa who on a slight acquaintance with the case persistently traverses his mature opinions and lightly brushes aside his settled judgments ? Must he protest, or must he submit ? Must he engage in an unseemly wrangle, or must he like Shylock exclaim :—

“ Shall I bend low and in a bondsman’s key
 With bated breath and whispering humbleness
 Say this :
 ‘ Fair Sir, you shake my patient’s confidence in me,
 In April last you made me seem a fool ;
 You mocked me such a day ; another time
 You called me dunce : and for these courtesies
 I’ll send you all my cases ? ’ ”

The answer to such a question necessarily depends upon many matters too intricate to be mentioned here. But my point is that the question ought never to arise, and I feel confident that it would arise far less frequently than is now unhappily the case if those who practise at health resorts would abandon the position which some of them have assumed, that, namely, of demanding to be regarded as consultants, while adopting methods towards their *confrères* which no consultant would ever think of adopting.

But if he should neither play the house physician nor masquerade as the consultant, what is the poor health resort

practitioner to do? What is to be his attitude towards those at a distance who confide their patients to his care? Well, I admit that it is difficult, if not impossible, to place him in any recognised category. From the very fact that we propose to discuss the rules of conduct which should guide him, we allow that whether he be a star of major or minor magnitude, he is *sui generis* in the medical firmament, a sort of elusive quick-change artiste, now a consultant, anon a general practitioner; yesterday a surgeon, to-day a physician, and to-morrow a gynæcologist, who when you would arraign him in one capacity, promptly takes refuge in another. Nevertheless, I think he may be made to conform more nearly to one recognised type of medical man than any other, and it seems to me that it is in terms of this type, namely, the *locum tenens*, that we may most profitably consider him. Now what is a *locum tenens*?

A *locum tenens* is a person who does the work of another during the enforced absence of that other from the scene of activities. During the term of his office the *locum tenens* is, as it were, in supreme command, with power to initiate, to modify, and even to annul, in accordance with his own judgment; but in connection with these powers he must keep two facts ever before him. The first is that his position is only temporary, and the second that he holds that position in trust for his principal. The essentially temporary nature of his position should keep him from introducing radical changes into the treatment of any particular case, and should warn him against insisting upon any modifications, which he may think right to introduce, being continued after his ministrations are over. That he holds his position in trust for his principal should entail upon him the obligation to use all his endeavours in defence and furtherance of the latter's legitimate interests, and to refrain carefully from anything by which those interests might conceivably be prejudiced.

This is, I think, a fair if a somewhat idealistic statement of the rules which should guide the conduct of an ordinary *locum tenens* in his relations with his principal: the question is, how far can we apply these rules to the conduct of the

health resort practitioner in his relations to the sender of a patient. I fully expect to be told that no analogy is possible between the two cases, for the reason that the monetary relations are totally different, the *locum tenens* being paid by his principal, whereas the health resort practitioner is paid by the patient. This will seem conclusive only to those whose sole measure of an obligation is provided by pounds, shillings, and pence, but even they may be given pause by the consideration that if the sender had not advised the patient to go to a particular place, and to a particular practitioner at that place, the practitioner in question has cause to lament that he is paid neither by principal nor patient. To those, however, who realise that there exist obligations which cannot, and, indeed, must not, be stated in terms of cash, the above analogy will not appear impossible. It is not, of course, complete, but it may, I think, be made to serve as a basis whereon we may construct some useful formulæ, which will aid in the solution of the present problem.

One of the main differences in the two cases arises on the question of correspondence. The prudent, the tactful, the really helpful *locum tenens* seldom or never worries his absent principal with letters ; whereas, as we have already seen, the loyal and conscientious health resort practitioner makes a point of communicating anything of interest or importance as soon as it arises. But this difference is, in reality, all in favour of smooth relations between the spa physician and the sender. In the presence of unforeseen circumstances the former may take the opinion of the latter, whereas the *locum tenens* is obliged by an unwritten law to act on his own unaided judgment, and the very fact of his doing this may bring him ultimately into conflict with his principal. This difference, then, so far from presenting a point of difficulty in the adoption of the view which I am indicating, is in reality all in favour of the suggestion, and the same may be said of all the other points of difference which have any real existence.

Let us, then, regard the health resort practitioner as the *locum tenens*, the accredited agent of the person who sends

the patient, whether the latter be consultant or general practitioner ; and let us see what rules of conduct will emerge from this view of the situation.

In speaking of the *locum tenens* I said that during the term of his office he was in supreme command, with power to initiate, to modify, or even to annul, according to his judgment. Now this appears to me exactly to express the position of the health resort practitioner. When the case reaches his hands he must review all its features from the standpoint of local conditions and must frame his treatment accordingly. If he finds himself at issue with the sender on the question of diagnosis, he must take immediate steps to bring about an agreement, and if an agreement should prove to be impossible, he must either resign the case or give the patient the opportunity of deciding between the divergent views. With the question of diagnosis settled, the local practitioner has a free hand in the matter of treatment so long as the patient is under his charge. There is one exception to this general rule, which is presented by the case where a patient is sent with a request that he may be given a certain number of baths, douches, or packs. Here the local man has only to carry out his instructions and he should not go outside them without good and sufficient reason, which ought at once to be communicated to the sender. Except in the presence of definite instructions of this nature, however, the health-resort practitioner must take the sole responsibility of the line of treatment which he considers suitable, though, as I have already said, it is courteous and wise to write to the sender indicating briefly what he proposes to do.

But, like the *locum tenens*, the health resort practitioner, in arranging his plan of campaign must, above all things, keep prominently before him the salient fact that his functions are only temporary. And this he seems constitutionally unable to do. It is quite common to find otherwise honourable loyal and straightforward spa physicians, who order mixtures and modifications of diet to a patient just as the latter is leaving the spa, with directions that they should be continued for an indefinite period. This can only be regarded as wrong in

principle and as highly inexpedient in practice. It is wrong in principle, because the spa physician's ministrations are essentially local and temporary. They are presumably influenced by local considerations and should therefore cease when those considerations are no longer operative. It is inexpedient in practice, because it is calculated, nay, it is bound, either to tie the hands of the sender or to force the latter into setting aside the spa physician's instructions, either of which results is most undesirable. The sender has clearly the same right to a free hand in the management of the case when it has returned to him, as the spa physician has during the patient's sojourn at the spa.

Of a *locum tenens* I said that he held the position in trust for his principal, and I think it would be to the advantage of all concerned if the health resort practitioner would regard himself as holding the patient in trust for the sender. Such is his real position, and it is because he too often forgets it, too often regards himself as an independent, instead of a co-ordinate, authority, that causes for friction are apt to arise. The realisation of this position would have two results, both of which are highly desirable. The one is that the health resort physician would refrain from criticising the previous treatment to which the patient has been subjected ; the other, that the patient would be counselled to report himself to the sender as soon as possible after the special course is over. These points I am happy to think are very scrupulously observed by a large number of those practising at health resorts, but it is desirable to emphasise the importance of their being observed not by some only, but by all.

As being a co-ordinate rather than an independent authority, the spa physician has in my opinion no right to advise a patient to return to the health resort for say three successive seasons. If he thinks such a course is desirable he should urge it upon the sender and not on the patient. It is the sender who has the general supervision of the case and he may for many reasons deem it preferable that the patient should another season go to some other resort. Apart from this, a spa physician should be careful to avoid advising any-

thing which may bear the construction of being dictated by purely selfish motives, and the suggestion that a lucrative patient should return for a definite number of seasons does not, on the face of it, seem to arise from motives of the most exalted altruism.

In conclusion, therefore, I suggest that the "clear understanding" of which we are in search and which we all desire to see established, unless it is previously modified by an agreement between the parties, shall be deemed to comprise the following clauses :—

(1) That the health resort practitioner has a right to a free hand in all the details of treatment, so long as the patient is under his immediate care.

(2) That this right exists only so long as the patient remains at the health resort ; and that any criticisms of previous treatment, or anything thought desirable as complementary or supplementary to the health-resort treatment, should be submitted to the sender and not to the patient.

(3) That the length of time necessary to the carrying out of the health resort treatment is a matter for the health resort practitioner to decide ; but that suggestions as to the desirability of future courses of treatment should be made to the sender and not to the patient.

DISCUSSION.

Dr. MOUILLOT (Harrogate) said he had listened with the greatest pleasure to Dr. Leonard Williams' paper, which he thought would, in the main, meet with agreement from all. He was a much more depraved character than Dr. Williams described himself to be, because he was a poacher turned gamekeeper, inasmuch as he (Dr. Mouillot) was gamekeeper turned poacher. He cordially agreed with the statement that the spa physician should receive a letter in respect of the patient sent, from the physician who sent him, but he would stipulate that it should always be sent by post, and the person sending the letter should give a card introduction to the man to whom he was sending the patient. The reason was that many patients sent by their physician to a particular doctor

went to another, in which case naturally the spa doctor did not acknowledge such letter. Much unpleasantness and disagreement arose from that cause ; he had frequently been taken to task for not writing about patients whom he had never seen. If patients preferred to go to another doctor that could not be helped, and he did not complain in the least, because probably some patients sent to other doctors found their way to him. But he would like to receive a letter with or about any patient so sent, so that he could acknowledge it. The crux of the matter was the temporary nature of the advice given to a patient who was sent to a health resort. Patients almost always came to the doctor just as they were about to leave the town—and they were probably going to another town before returning home—but, according to Dr. Leonard Williams' paper, the spa physician would not be able to give advice to apply to the period between leaving the health resort and returning to his home, though that might be weeks or months. For instance, a patient from London makes a stay at Harrogate, and from there goes for some shooting, perhaps to the north of Scotland, delaying his return to London until the following spring. Even if he were only going to be absent a week, some advice might be necessary. If he had been taking aperient water for three consecutive weeks, it was necessary to tell him how to avoid feeling the loss of that water during the ensuing week or two. It did not do to stop suddenly treatment of that kind, for serious illness might result from intestinal accumulation. Therefore he did not go so far as Dr. Williams in saying that the connection between the patient and the spa physician should cease on the very day the patient left the place. But he agreed that in all cases the further treatment should be carried out under the supervision of the doctor who sent the patient ; and he was absolutely convinced that the health resort doctor should not suggest to the patient a return visit on future seasons. The patient almost habitually asked the question, and his reply was, "If your ordinary medical adviser finds the treatment has done you good this year he will probably advise you to

come again." That was all right in cases where the patient was sent to one, but, as Dr. Street had reminded him, Dr. Leonard Williams had lost sight of the fact that a large proportion of the patients were not sent by anybody, they perhaps met a friend, who said, "My liver was out of order, so I went to Harrogate last year. You seem to be in much the same state, and I advise you to spend a few weeks there." In the early stages of his professional life at Harrogate he did take the trouble to find out the name of every patient's doctor and communicated with him, but a record kept showed that not more than 6 per cent. of the letters were acknowledged. Therefore, unless there was some special reason, he did not continue that practice. If a patient came he treated him; he went away, and he (Dr. Mouillot) knew no more of him. His experience confirmed the remark of Dr. Leonard Williams, that medical men, as a rule, were not good at letter-writing. In writing to the spa physician everything which had been told to the patient should be put in the letter. It sometimes happened that the doctor omitted something which he had told the patient, and he thought any spa physician would admit that that had occurred to him dozens of times. One read the letter sent with the patient, wrote out a prescription for the baths and the waters, and was then told by the patient, "My doctor says I am too weak for baths; I am only to have the waters." That placed one in an uncomfortable position. Either one had to retract the prescription—which was the right course—or disagree with the doctor. He believed the safest procedure was to leave the details of the treatment to the medical man to whom the patient was sent. Some of the suggestions for treatment which were sent were very strange. About two years ago he received a letter from a doctor, with a patient, suggesting that the patient should go to the spa early in the morning and take a tablespoonful of the strong sulphur water. If that prescription had been written he would have been the laughing-stock of the place, because the water was usually taken in 10 oz. glasses. But he hoped that out of Dr. Leonard Williams' paper and the ensuing discussion a fixed

agreement would be arrived at, and on the lines he had mentioned, namely, that the medical man sending a patient should send the letter concerning him by post, giving as few details of the line of treatment as possible, but all details given to the patient to be also told to the spa physician. The medical attendant at the health resort should regulate the treatment for a week or so, and it would be in the power of the patient to see his own medical man, but any suggestions for future treatment should be written direct to the spa physician. He thought the position which the spa physician was capable of taking up with regard to a case depended a good deal upon the position of the man sending the patient. In the case of patients sent by the ordinary medical practitioner the spa physician could be said to be a specialist in his own particular departments ; but he did not suggest that he was a specialist in reference to the consultant. For, instance, in such a place as Harrogate one saw many cases of gout, rheumatism and skin diseases, many more than the average country practitioner, and it would be his province to give advice as to future treatment of the patient which he would not dream of suggesting to a doctor with more special experience.

Dr. DOUGLAS KERR (Bath) congratulated Dr. Leonard Williams on the excellent manner in which he had handled a subject which bristled with thorns. He had summed up as counsel between the London consultant, the general practitioner, and the spa physician, in an admirable way. On first hearing of the subject chosen he did not see where there was room for a paper. The whole relations regulating the conduct and treatment of members of the profession by one another, which was termed medical etiquette, might be summed up in a very few words : honourable and kindly treatment of one gentleman by another, always remembering that over and above one's self there was the responsibility to one's patient. There were no points in the paper to which he would take exception, though there were some upon which he would enlarge if he had time, particularly the question of after-treatment, to which Dr. Mouillot had alluded. The spa physician

who had been fifteen or twenty years in the place, and whose patients mostly suffered from a particular class of affection, had the right to consider himself a specialist in his own line, especially in relation to the country practitioner, who probably saw but few cases of the kind in the course of a year. For instance, in the case of Aix-la-Chapelle and syphilis, the average country doctor saw very few cases of that disease in a year, but the Aachen spa practitioner was surrounded by syphilitic patients, and could justly regard himself as a specialist in that disease. But the difficulties could be overcome, as the opener suggested, by a courteous letter in the kindest of terms, advising what treatment should be pursued, and even in the case of syphilis, the desirability of a return to Aachen, not once, but two or three times, or until the syphilis was eradicated. But with the whole tone of Dr. Williams' remarks he was entirely in accord, and he felt sure every spa practitioner in England would thank him for initiating the discussion (which he hoped would be elaborate and full) on the relations of spa practitioners with those gentlemen who were good enough to send them their patients. No advantage which the spa physician could gain from self-glorification and magnifying his office to one or a dozen patients, would recompense him for an injury done to one colleague. He felt sure the Society had done much to rub off the corners and jealousies and discomforts of spa practice in England. Should the discussion lead to a better understanding and a wider appreciation of the relations between the spa physician and the consultant at the large centres and between them and the general practitioner, Dr. Williams would have ample reward for any trouble he had taken in reading the paper.

Dr. BRAITHWAITE (Buxton) said, that as one of the younger spa practitioners, he desired to thank Dr. Leonard Williams for his excellent paper, and the way in which he had avoided hurting anyone's feelings. The paper would do much towards an understanding between the spa physician, the general practitioner, and the consultant. He agreed that it was the duty of the spa physician to answer every letter sent with a patient. The majority of the patients

came without the knowledge of their medical men, and he saw no reason for enquiring who were the doctors of those patients. Moreover, it allowed the interpretation that the spa physician in those cases was trying to advertise himself to the profession at large. With regard to the question of whether the spa physician's function was equal to that of consultant, or house physician, or *locum tenens*, he thought doctors practising at spas became experts or consultants on certain diseases. The people who came to his own spa mostly suffered from gout, rheumatism, and rheumatoid arthritis, and certainly the man who had practised there some fifteen years became an expert concerning those diseases, and was justified in advising patients what they ought to do afterwards. Where the patient had been sent by another doctor, that advice should be communicated to such doctor, but otherwise the patient should be told what was best for him when he returned home. If the patient would apparently benefit by returning to the spa, the spa doctor would be justified in telling him so, but he should be directed to tell his doctor what advice had been given him. The whole matter could be expressed in the words, "Do unto others as you would have them do unto you."

Dr. SYMES THOMPSON said he thought the Council deserved warm thanks for suggesting the subject, and certainly the meeting felt indebted to Dr. Leonard Williams for the masterly way in which he had brought the matter forward, avoiding the dangers which seemed inevitable in dealing with such a subject. The first point he wished to refer to was, that when the spa doctor was kind enough to write accurately and fully to the physician, it was not labour thrown away, for it gave the London physician an insight into the capacity of the spa doctor. From time to time he had come into touch with men of whom he had previously little knowledge, but whose letters had been so masterly, so clear and forcible, that he (Dr. Thompson) was able to realise that he was corresponding with a man who was peculiarly fitted to deal with other cases committed to him, and to whom we could confidently transfer our patients. When Dr. Leonard Williams read the first part

of his paper he (Dr. Thompson) felt how remiss he, as a London consultant, had often been in failing to do that which was spoken of as a manifest duty, and neglect of which stamped a man as faulty and incompetent in his work. It often happened to the consultant in London that a patient spent some twenty minutes with him, was advised to go to a particular spa, and there was an end of the matter. A minute or two afterwards another patient was seen, almost before one could record the place to which the previous patient had been sent, and the facts were not so impressed on the mind as to enable the letter to the spa doctor to be written in the evening. The paper which had been read constrained him to hope that he would be less blameworthy in the future than he had been in the past ! Such letters need not be long or voluminous, but they put the consultant into happy relations with his friends at a distance. Those relations were for the good of the patient, because a recognition of the fact that the medical men were mutually desirous of doing the best possible for the patient, was a fact which helped towards the ultimate cure. So that from that point of view it was the right course to write the letters referred to. He did not recall having often noticed failure on the part of the spa physician who had given advice to patients ; but he was not one of those who felt he had any proprietorship in his patients, and he did not suffer from a sense of injury when he found that the counsel he had given to the patient had not coincided with that given by others, when, for instance, it was proposed that the patient should go to the same spa again ; he would not regard it as a wrong if the spa doctor suggested to the patient that he should return to the spa on a future occasion. The subject was of such extent that he scrupled to occupy the time of the meeting longer, but the points brought forward on that occasion would serve to emphasise the fact that the Society did not exist for nothing. Dr. Leonard Williams' paper was calculated to do much to improve the relationships between the consulting doctor and the spa physician.

Dr. HARBURN (Buxton) thought the profession was greatly indebted to the Council of the Society for initiating

such a useful and necessary discussion as the one now going forward, and he hoped the paper would be more fully noticed in the *Lancet* and *British Medical Journal* than was usually the case, as he feared that only a small proportion of the profession read the Society's Journal. He felt very much obliged to Dr. Leonard Williams for his able paper, with nearly all the conclusions of which he heartily agreed. His experience was that when one received with a patient a letter from the home practitioner there was very little chance of friction. But he agreed with Dr. Mouillot that in cases coming to the spa physician without a letter one could hardly be expected to write. His experience also had been that the rule was not to receive a reply when one did write. He thought the letter should contain no attempt to tie the spa physician down to any particular treatment. The patient came with very great confidence in his own physician, and an attempt to tie the spa physician down in the matter of treatment would make his position during the patient's stay very difficult, especially if—with his superior knowledge of the resources of his spa—he found it would be to the patient's advantage to depart from the lines laid down. There were a few cases in which friction might palpably occur where there was a difference in diagnosis. Now and then there were cases in which, on examining the urine, there were found evidences of Bright's disease, or diabetes, which had been overlooked by the home practitioner, because he had not examined the urine. But in such cases, with a little tact and diplomacy, matters could be arranged without friction being caused. In all cases it was a duty to prevent difficulties arising whenever possible by communicating privately with the home practitioner, and not to attempt to glorify one's self by saying too much to the patient. He could not go to quite the same length as had Dr. Leonard Williams in regard to silence in reference to what the patient should do when he left. Patients nearly always asked what dietary and medicines they ought to take after they reached home. In his own practice, when he thought his experience enabled him to suggest remedies, also

diet, he communicated it to the home practitioner, and he had seldom found any difficulty arising in consequence. On the contrary, the home physician would often say in his letter that he would value any suggestions which might be made.

Dr. LUFF heartily congratulated Dr. Leonard Williams, and through him the Society, on the very tactful way in which he had introduced what might have been a very difficult subject to handle. He thought that from the discussion some very useful results would ensue, and, especially, that the suggestion made by Dr. Mouillot might become an unwritten law—that letters sent from the practitioner, whether in London or in the provinces, to their *confrères* at the spas, should be sent by post. He admitted there was a difficulty about it. Frequently in his own practice the patient requested that he or she should be the bearer of the letter to the spa physician, and it was then very difficult to refuse the request. But he made it an invariable rule that every patient sent to any spa physician by him should have a letter dealing with his or her case. Another invariable rule with him was to leave to the spa physician an absolutely free hand in regard to the treatment. Needless to say, when the patient bore the letter he made it an extremely diplomatic one, remembering that it might be opened by the patient. If the suggestion of Dr. Mouillot with regard to letters could be followed a fruitful issue would have come out of the discussion.

With regard to the position of the spa physician in relation to the rest of the profession, he was pleased to say that his relations with his *confrères* at the various spas had been of the happiest character, with one or two exceptions, and it was only fair that he should state those few exceptions. He strongly objected to the very exceptional practice of a patient when leaving a spa being recommended a certain dietary to follow out on leaving the spa. It might be that the spa physician thought it right that the patient should follow out a certain dietetic treatment; but then by all means let the spa doctor communicate that to the man who sent the patient. When the patient was not sent by a medical man,

then, of course, the spa physician could recommend what he wished. He was referring to cases in his recollection where he had sent a patient and a letter to a spa physician, the patient had gone through the course of treatment, and then, on the very day of leaving the spa had received from the doctor a paper setting forth dietetic instructions to be followed after leaving the spa. That practice he regarded as absolutely wrong. The two or three cases of the kind which he could remember absolutely burned in his memory. One of those cases suffered from diabetes, another from gout, and the third from rheumatoid arthritis ; they all came from the same spa and all received precisely the same diet-sheet, word for word. He also thoroughly agreed with Dr. Leonard Williams that when a patient was sent by a physician to a *confrère* at a spa, that patient should not be advised to return to that spa. Such advice might be very desirable—and he did not say it was not—but it should be given to the medical man who sent the patient to the spa, and it was he who should give that advice to the patient.

Dr. SHIRLEY JONES (Droitwich) said he thought it was only due to the opener of the discussion that everyone who could conscientiously do so should express acquiescence in everything which had been put forward in his paper. He felt inclined to comment on only one point, namely, the sending of a letter by the consultant to the spa physician, suggesting a line of treatment to be pursued. He was sure the practitioners at the various spas would welcome such letters, and pay every attention to them ; and he was happy to believe that the consultant would support any alteration which the spa physician thought it necessary to make in the treatment. It was obvious, in regard to the various spas throughout the world, each treatment was of such a specific nature that it could only be gathered and appreciated by a term of experience at the particular spa, and consequently, the physicians resident there were in the best position to carry out the treatment ; so that he thought the spa physician would be only too thankful for any letter containing suggestions as to either diagnosis or treatment, provided he were given a free hand to alter it if he liked.

Dr. LEON BLANC (Aix-les-Bains) said he had been extremely pleased to hear the discussion. What had been said was not only extremely good, but it was what a long practice showed was the best. He would only add one word to the discussion. A patient asked the spa physician whether he should come next year. The physician thought he should, but he must not say so to the patient. His rule was to reply that the patient was to come again if his physician in Paris or London told him to, because he would have to see what had been the effect of the baths. It was a question of diplomacy on the part of the doctor. He was very thankful to have heard Dr. Leonard Williams' paper, because it was extremely advisable, both in England and France, to have rules of confidence between the doctor who sent the patient and the doctor who received him. The more that confidence was observed between doctors, the higher and more respectable would the profession stand.

Dr. LEONARD WILLIAMS, remarking on Dr. Braithwaite's observations, explained that his (Dr. Braithwaite's) point was that the patient's doctor being communicated with by the spa physician when that doctor had not sent the patient might be held to constitute advertising. But intraprofessional advertising was altogether respectable and regular; it was extraprofessional advertising which the doctor had no right to indulge in. If a doctor liked to write to a brother professional on some point which might be held to affect the patient, or otherwise, that brother practitioner was in a position to assess the value of it, and to know whether it was written with the view to advertising, or for the benefit of the patient. At the risk of the letter receiving the interpretation which Dr. Braithwaite feared, it was the duty of the spa physician to communicate with anyone who had an interest in the further course of the case. He would like to cap the story told by Dr. Luff about sending a letter by the patient. It was told of Sir William Gull, who sent a patient to a friend of his at Brighton, and the patient insisted on taking the letter by hand. She was a neurotic lady, and while in the train she had a fluttering at the heart and felt very bad, and felt that

she must open the letter to see what Sir William Gull had said. It ran : " Dear Jones,—Herewith I send you a golden goose ; pluck her and send her home."

Dr. LUFF, in further contributing to the debate, said Dr. Leonard Williams' remark involved a very important question, *i.e.*, the case of a patient who went to a practitioner at a spa without having been introduced by his previous medical attendant. He did not agree as to the liability on the part of the second practitioner to write to the unknown one. Taking the kind of case which certainly arose in consulting practice, a patient came to consult him (Dr. Luff), but had not been sent by any medical man ; he made a point of enquiring who the medical man was. Was he to write to that medical man ? He did in his younger days, invariably, and the consequence was he remembered on one occasion receiving a letter, the purport of which was, " Whoever asked you to write to me ? " The rule he made, and he thought the spa physician might follow it, was to say to the patient, " It is true your medical man did not send you to me, and it is through you I must communicate with your medical man. You must tell your medical man that if he wishes to hear my opinion I shall be happy to give it." In other words, the patient's medical man must first approach the consultant.

Dr. FORTESCUE FOX, in response to the President's invitation, said he had not proposed to take part in the discussion. He agreed with Dr. Luff's view, and thought that if a spa physician were to habitually write in reference to his patients to unknown medical men, he might approach to within measurable distance of betraying professional confidence. He did not think the patient would appreciate it, and he doubted whether the medical man would do so either. Like other Fellows, he was personally indebted to Dr. Leonard Williams for his paper, which would prove helpful.

Dr. SNOW (Bournemouth) said the only comment he would make on the paper was that it was too perfect, too tactful ; it had been put forward without hurting anyone's feelings.

Dr. SEPTIMUS SUNDERLAND said that he agreed in the main with most of the remarks of Dr. Leonard Williams in

his paper. There seemed to be some difference of opinion amongst the speakers as to the advisability of the spa physician's writing to the medical man who might have sent a patient to a spa without a letter of introduction. As bearing on this point he might mention that it was a good number of years since he (Dr. Sunderland) sent a patient to Buxton, advising her to take a few baths, but without giving her a letter to any medical man at that spa. She came under the care of their lamented friend, the late Dr. Samuel Hyde, who wrote him concerning her treatment. That was his first introduction to Dr. Hyde; later, he sent other patients to Dr. Hyde, and followed it up by going himself as a patient. While he was at Buxton they had many talks about climate and kindred subjects, and the upshot of it all was the foundation of this Society, which owed so much to Dr. Hyde's untiring efforts in its early days. He did not hold any strong views either for or against the procedure adopted by Dr. Hyde in the case referred to; he mentioned it merely as an interesting fact out of which he thought good had resulted. He was inclined to think that in such instances as the one referred to, the question of writing might be left to the discretion of the spa physician.

Dr. LEONARD WILLIAMS expressed his thanks for the complimentary remarks which had been made about his paper, and for the gratifying manner in which the paper had been received. His only criticism about the remarks was that they had not been sufficiently controversial. He was polemic by nature, and therefore he did not feel quite happy in an atmosphere of mutual admiration. If someone had said something unkind about the paper, or had ventured to criticise it in somewhat vigorous terms, he would have been delighted. He could not find anything even in Dr. Mouillot's remarks which he could controvert, in spite of his rather aggressive manner. He fully agreed with Dr. Mouillot as to the desirability of letters being sent by post, as witness the story told by Dr. Luff and the one which was credited to Sir William Gull. He was also reluctantly obliged to agree with Dr. Mouillot's criticism of one of his axioms,

which he understood to be the following: if a patient left a spa for a certain space of time to go to some place other than his home or to the person who advised him to visit the spa, it was advisable that the spa physician should indicate the course of treatment to be adopted during that period. That simply involved what in France and Germany was called the "after-cure." If the patient went anywhere else for after-cure, and it was not necessary to place the patient under the care of a physician at that place, the spa physician had a definite and distinct right to advise him as to what he should do during that after-cure. He still maintained that when the patient returned home he should not be clogged, nor his physician hampered, by restrictions framed to deal with the patient after he left the spa. The spa physician's ministrations were local and temporary, and should be guided by local considerations; and when they were at an end the advice of the spa physician was no longer operative. He had been very glad to hear Dr. Luff's remarks about writing to practitioners who had not sent patients. He knew the question was very difficult, and he was not prepared to dogmatise on it. Being of an artistic temperament, he felt it was right to act on ideal lines in those matters, namely, that one should do what one conceived to be the right thing, irrespective of difficulties. But when one received slaps in the face for doing the right thing, one was apt, in the course of years, to get sick of the right thing. He had no doubt that Dr. Luff's course—instructing the general practitioner that if he wanted to know what Dr. Luff thought, he should apply to him—was the right one.

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THE CLIMATOLOGY OF THE SAHARA.

BY HENRY MCLURE, M.D., M.CH.

MR. PRESIDENT AND GENTLEMEN,—It may seem to you presumptuous on my part, with my limited experience, to attempt the task I have set before me. My only excuse is that I have lived on and travelled over other deserts than the Great Sahara. These desert regions were in North America and were approximately in the same latitude and, in general, of the same altitude. Their climatic characteristics are much alike.

In the district I speak of, lying between the Rocky Mountains of Colorado and the Sierra Nevada of California, and extending south to the Mexican border, it may be stated, as a general rule, that all the country below 1,000 m. above sea-level is a *real* desert, and between 1,000 m. and 1,500 m. is a partial desert. In this desert country the rainfall varies almost directly with the altitude. The low south-western section receives less than 125 mm. a year. This region comprises the submerged Colorado desert, 350 feet below sea-level, the Arizona desert, with an elevation at Yuma of 140 feet—the mean temperature is 72° F.

This is the hottest part of the district—the Hornado del Meuorte of New Mexico, and the Great Llano Estacado of Western Texas. With the Llano Christianos of Mexico I have had considerable personal experience.

These places approximate very closely in all climatological factors to the portion of the Sahara of which I am about to speak. In approaching the scientific comparative climatology of a place, we want to get at first just what elements are essential, in a systematic description. I am afraid there is still a good deal of confusion in the ordinary methods of

approaching such a subject. About five years ago in Munich I had a conversation with an American climatologist, whose views might be roughly indicated thus. That the feeling of the individual was, after all, the best guide; he would test it in the following way. In different health resorts over the Continent, at different altitudes and latitudes, he would take, say ten patients, suffering from various complaints. Without giving warning, and on no account were they to know whether the wind was east or west, the barometer reading, &c., they were simply to be asked, "How do you feel?" When each answer is recorded then the reading of thermometer, barometer, sunshine record, atmospheric moisture, blood pressure, &c., is taken and appended to the answers. By a long series of such observations from different health resorts sufficient data might be accumulated so as to give, to my mind at least, a fairly scientific basis for reasonable comparative climatology. I do not know that this scheme has been adopted as yet. In the *Journal of the Society* for January, 1894, in a scheme for the comparison of climates based upon temperature and humidity, the author, Mr. B. Tyler, coined a new word, "hyther," to indicate their joint effect on the individual. What differentiates the desert climate from that of other regions is, first—its latitude involving the direct insulating factors—light and skylight, and the absence of clouds.

"The most cloudless regions in the world are probably to be found in Northern Africa, Arabia, the desert regions of Arizona, New Mexico, and perhaps also in the interior of Australia."

The decrease in these regions in the mean cloudiness is from north to south; the rainfall is about 8 inches in this part of the Sahara, and the air is relatively dry even in winter. The diurnal ranges of temperature increase with increasing distance from the ocean, as does the annual range, the greater and more rapid warming of the land surface and the stronger insulation increase the daily temperature maxima, while, on the other hand, the clear sky and dry air at night favour rapid radiation, and cooling of the earth's surface, producing low

nocturnal minima. Thus results a large diurnal and a large annual range. In marine and *littoral* climates by the presence of moisture this radiation is checked, hence the diminution in the daily and annual range. The temperature of the desert varies much, yet people living here usually endure, without the slightest discomfort, great changes of temperature which would be very harmful in damper climates; this is due to the rapid evaporation from skin and lungs. When we consider that an adult man eliminates in this way 900 grams of water daily, we have some idea of the relative humidity; a diminution of even 1 per cent. would cause a perceptible change in the amount of evaporation. If the evaporation from the skin and lungs are diminished the amount of urine is increased, as in many cases are also the secretions from the intestines. For this reason sudden changes in the humidity have very injurious effects on a body which is not in health. Such changes make themselves felt chiefly in the sudden increase or decrease in the pressure of the blood. For this reason the determination of the variability of the relative humidity is a necessary element in a complete estimate of a climate with reference to its relation to health. The less diluted blood of dry climates operates as a stimulant and increases the functions of the nervous system. The consequences are, as a rule, excitement and sleeplessness.

This is my experience of a dry mountain climate, but not that of a desert climate. In this dry desert air ozone is present in a notable quantity. Of its beneficial climatic importance I am not so favourably impressed as I once was. I am convinced when it is at all concentrated it has decidedly irritating qualities; be that as it may, its presence indicates the absence of organic impurities and products of decay. This gas acts as a powerful oxidiser and antiseptic and seems to have a markedly destructive effect on low forms of life. According to Binz it is a decided soporific.

Atmospheric electricity must here play a part of undoubted importance. Here are all the conditions favourable to its action, an almost perfectly insulating atmosphere in which

the electric tension in the individual is necessarily increased. I cannot help thinking that the sense of exhilaration one feels is most likely due, in some measure at least, to this increased electric tension.

In regard to the chemical intensity of sunlight and skylight one can get an idea of their relative value in different places. At Manchester, sunlight has a value of 145, skylight 182, making a total of 327. Cairo has 364 and 217 respectively, and a total of 581. Rays of slight refrangibility, *infra-red red* and *yellow*, are the most important to the growing plants. They attain their greatest luxuriance under such influence, so the blue and violet rays are not the most useful to plants, as we formerly supposed.

Biskra is an oasis of the Sahara in latitude $34^{\circ} 55' N.$, 10 degrees south of Nice, south side of the Auris Mountains, an extension of the Atlas range. Though lying well out in the desert these hills shelter and encompass it in a half-circle, which is completed by the far-off horizon of the desert, which appears as calm blue sea. It is reached from Marseilles. One has the choice of going to Algiers or Phillipville. The latter has not good boats but the route is more direct. The accommodation on both lines might with advantage be improved. The journey takes two days if the weather is favourable. If you choose Algiers another twenty-four hours' journey in a slow train brings you to Biskra.

Biskra, the Queen of the desert, as it is called, stands 360 feet above sea-level; it is an oasis including five Arab villages of the usual type, and is a great trading centre, great caravans of camels daily coming from or going out into the desert. There is a good hotel here, and the usual casino with the usual amusements. Of the climate of this portion of the Sahara I am able to speak from personal observation for three weeks, beginning January 7, of this year, supplemented by three weeks' prior observation by a friend, making six weeks together. During this time excepting four days there was bright sunshine and absolutely cloudless skies. In those four days we had yet some sunshine and a little rain. The wet bulb thermometer plays an important rôle here. It gives the sensible

temperature, and is a convenient index of the degree of heat, which is actually felt by the human body. For instance, you may have a temperature in the desert regions of 45° or 46° C., yet the wet bulb thermometer gives a reading of 20° to 21° . Sunstroke is almost unknown in the dry desert countries. The sunshine, as I have already pointed out, is a factor of the first importance. There is a general consensus of opinion that it makes for cheerfulness; we have seen its effect in vegetable life in increasing the metabolic processes. We have every reason to believe that *animal life* is affected in the same way. We can understand the Arab saying of the date palm, "It stands with its feet in the water and its head in the living fires of Heaven."

In this absence of moisture we have seen what a wide range of temperature man can support without hurt. One can live out of doors all day in the sun, riding or walking without discomfort. Much less fatigue is felt after exertion than one would expect. The climatic difference between the coast and the desert was strongly emphasised during my recent visit. The hills round Algiers were covered with snow, also the mountain range of the Atlas with an elevation of 3,000 feet, which intervenes between the coast and the desert. Needless to say it was bitterly cold, but an amazing change was experienced in passing through the gorges of El Kantara. Here the marvellous colouring of the desert begins, the rocks glow and scintillate as the descending sun touches them into a life of vivid colour. Here the cold, the clouds, the snow, are left behind as we rush into the great desert, with its warmth, its colouring, its delicious air with its mysterious exquisite perfume.

As for the therapeutic influence, as I have said, it stimulates metabolism, resulting in increased elimination, therefore I should say where toxic products are present in the organism the climate would be indicated. As an example I give the case of a gentleman whom I met in Algiers suffering from neuritis (toxic); he could not then close his hands, nor dress himself, and his power of walking was very feeble. After ten days' residence in Biskra, as I saw for myself, he could walk

almost as well as he ever did, he could close his hands and button his shirt, and he seemed in all other respects in excellent health.

Catarrhal complaints are common in Biskra, you hear a good deal of coughing among the Arabs, and colds amongst the visitors at first seem to rather prevail. Yet the person so affected does not seem to mind. He goes about as usual, looks all right, eats and sleeps well. Due to the absence of moisture and micro-organisms, meat when exposed to the sun and air does not decompose, but simply dries up. The healthy or comparatively healthy people whom I met here all expressed themselves as feeling unusually well. Cheerfulness and activity are marked features. I noted the afternoon siesta is generally dispensed with, people preferring after lunch to go out and do something—walking, riding or driving. The desert Arab is as a rule of a fine physical type, straight, supple and sinewy, and in many instances would serve as models for all that the Greeks considered beautiful, in form, pose and grace.

They are about the finest horsemen I have seen and compare favourably with the Commanche Indian, the Mexican Vaguerro, or the Texan cowboy. They are cheerful, emotional, and *essentially* religious. *Allah* to them is no mere abstract conception, but an ever living reality, ever near them listening compassionately to their daily prayers.

This region is practically rainless in the winter; the average daily temperature in the shade during my stay 18 to 20° C., and in the sun it would be almost double this. Algiers during this time had a temperature six or seven degrees lower.

This part of the Sahara has been brought prominently before the public in Mr. Hichens' book, "The Garden of Allah." His picturesque and beautiful description of the desert is most accurate. The psychology of the story I leave for others to judge, yet at the same time it shows most vividly the reaction of the organism to the environment, and the power the environment has in revealing some of the dormant feelings and activities of our nature. That it has the power of appealing to the temper of *mystery, imagination* and wonder,

and at the same time creating the mood for the reception of these feelings, I do not doubt.

In all climatic schemes there is a necessity for scales of sensation—bracing, invigorating, stimulating, cold, hot, oppressively hot, &c. Here we are speaking as a rule of temperature and humidity. These are stimulations from our environment reaching us through the ordinary avenues of sense and appealing only slightly, if at all, to the psychical life.

The part the mind plays in influencing bodily function is familiar to us all, as is also its effect through the mind on the individual by change of environment. The facts of hypnotism, suggestion and auto-suggestion indicate another region of the mind, outside ordinary consciousness. This is the region of the subliminal, or the region below the threshold, as Myer or as Professor Richet defines it: the meta-psychical consciousness.

This part of our nature I believe in some strange way profoundly influences vital processes as well as widening and deepening our mental horizon. As with the solar spectrum so in our mental spectrum we have a visible and invisible part, the luminous rays from red to violet appealing to a sense organ we possess. On either side of this spectrum activities are going on unceasingly, the same ether ripples being the agents; the only difference being in the wave length, the infra-red being longer, the ultra-violet shorter. Beyond the red end come waves whose potency we recognise as heat and not as light. Beyond the violet end are waves still more wonderful, whose potencies are yet to a great extent unknown, whose mysteries are being investigated by the keenest scientific minds of our day.

So with the mental spectrum, the luminous rays may fitly represent the every-day working brain of man, and, as in the visible spectrum, there may be dark lines or absorption bands causing mental obscuration. Modern psychology is adding much to our knowledge of our conscious spectrum.

We must all admit that the emotions play a part of no little importance in our life here; one might say that the heart has been of greater significance in the history of our planet than

the intellect. Therefore I consider we are justified as climatologists in considering the influence our environment has, in bringing into play the healthy emotions of our nature. Most of us have felt—

“Some vague emotion of delight,
In gazing up an Alpine height,
Some yearning towards the lamps of light.”

Such emotions may be the response to certain stimuli; natural scenery I consider to be an important one, and I think the desert possesses this quality in a remarkable degree. As in sensations, so in emotions, we require some scale of measurement and comparison. Such a scale may reach from *De Profundis* to *Gloria in Excelsis*, from the mental condition of—

“The bird’s unhappy master
Whom unmerciful disaster
Followed fast and followed faster,
Till his song one burden bore
Of never,—never more.”

Or again, of—

“Be near me when my light is low,
When the blood creeps and the nerves prick
And tingle, and the heart is sick,
And all the wheels of being slow.”

So we might gradually ascend the scale, till we reach the region where the saint and martyr has felt the joy that mixes man with heaven.

I have mentioned the intense exhilarating effect—the restless activity—produced by the lowest air; I may even go beyond this; we may experience with every breath we breathe, with each muscular movement, with every manifestation of our vitality, not merely a feeling of well-being, but one of intense enjoyment. In speaking of this to a learned member of our Society a few years ago, he said it was a question of bodily health, perfect digestion, healthy viscera and youth. He might have added:—

“Thy dream was good
While thou abodest in the bud,
It was the stirring of the blood.

If Nature put not forth her power
About the opening of the flower,
Who is it that could live an hour ?”

This seems to me an interesting problem : the viscera, when performing their functions in a healthy manner, we believe send no messages up to consciousness, but let their functions be disturbed they can send very unpleasant messages, as in nightmare dreams. Then might it not be that visceral sensation may be pleasurable, as well as painful ; that these feelings are remnants or vestiges of sensations long buried in our biological life called up by an appropriate environment. I think they *essentially belong to the red end of the human spectrum*, and that we share them with the antelope, the gazelle and the greater ape.

Here, in this region of the mystic, our very senses are cheated, the senses that are the world to us, the senses that guide us in our daily round or common task, that keep us in touch with our physical environment. Out of this arid land, with no tree or shrub higher than one's knee, there arise great shimmering lakes seemingly only a league off, with mighty trees casting their reflection in the limpid waters, *all so real, so tangible*, that my companions journeying with me are so convinced of those things that they absolutely laugh at my explanation that there are *no trees there, no water anywhere*. The mirage of the desert is a very familiar phenomenon to me ; a phenomenon which has over and over again deceived me, especially when weary, thirsty with a thirst the intense poignancy of whose pangs few have felt. The paramount burning desire to reach the water which seemingly is so near, gives one fresh courage. But our hopes, our desires, are cheated as our senses are, the mirage fades as dreams fade into the sad reality of sand and low-growing cacti.

Surely in this land of the mysterious one's fancy may be allowed now some licence. This air is divinely clear and pure, it is full of the miracles of an incense that comes not from flower or tree or earth, but from censurs swung by seraphim from out the celestial depths ; it thrills one with a sense of a new-born power, a sense of the uplifting of our higher

nature. In this light, in this secret yet permeating influence encircled by this psychic stimulus, we feel assuredly that we are reaching a higher plane, the human mental spectrum has widened its bars, the dark lines are now transparent, the vapours have rolled away, and from out the infra-red, hazy images of a long remote past in our biological life shimmer up to consciousness.

But it is in the other end—the ultra-violet—that the buried emotional treasures lie ; this is the region from which the poet, the artist, and the great masters of music have had their inspiration : the region of the highest emotions of our nature, the region of reverie, of ecstasy responsive as an Eolian harp to the influences that reach us out of the desert air.

And the night. Ah ! the night in the desert, when Nature's voice is low, and only soft whispers reach us from out the sleeping marge. The stars shine out with a radiance never seen in Northern climes, a radiance that seems to bring heaven nearer ; the great constellations with rekindled fire shine out like things newly awakened from slumber—the Bear, Orion—as we never see them here. As the Great Orion “slopes slowly to the West,” come visions of other deserts, when by Orion's slope I knew the time of night and watched hopefully for the advent of the Morning Star. These are the nights “so cloudless, clear and purely beautiful, that God alone is to be seen in heaven.”

Dr. SYMES THOMPSON said it was difficult in this Metropolitan centre to enter into the joys which Dr. McClure had shown to be associated with desert life. The paper was calculated to inspire one with thoughts far removed from those usually associated with the humdrum life of a great city. He had not shared the author's experience of the American deserts, but he had been in the African desert, both in Egypt and in Algeria, and he could perhaps enter with more appreciation into the delightful account which had been given than would be possible for those who had not been there. The paper brought up vivid remembrances of the marvellous solar effects at sunrise and sunset ; the wondrous influence, not only upon the eyes, but upon the whole being, was a realisation

which came to one in the desert even more than on the mountain-top. When at Biskra some five years ago, he had similar experiences to those which Dr. McClure had described in his paper; there was unbroken sunshine, without either cloud or rain. There was some wind, and wind in the desert was a trying accompaniment. In the desert pure and simple, the wind did not stir the sand much, as it consisted largely of particles of quartz; but in the districts where there were alluvial deposits, the wind lifted the small particles and one's nose and ears became filled with an irritating dust, causing considerable discomfort. Still, nothing could be more glorious and delightful than the desert proper. In the present atmosphere he did not feel equal to entering into the psychic conditions which had been described, but he would allude to one or two points referred to earlier in the paper. It was surprising how much water a man in that region could take without passing large amounts by the kidneys; the transpiration so rapidly relieved the system of it. With the rapid evaporation from the skin there was also a quick metabolism in all the tissues. He was reminded of an observation which was made to him by a French doctor at Biskra with reference to the influence of the Biskra spa, a water analogous to, and at least as valuable as, that at Aix-la-Chapelle. That gentleman had been in practice at Aix, and was thus able to speak by comparison. While at Aix he was accustomed, like other physicians, to add to the waters mercurials and iodide; but when at Biskra, prescribing for the Arabs, he limited his treatment to the waters, as the Arab had a determined hostility to drugs. In the cases of severe secondary and tertiary syphilis which came under his notice he was surprised to find that the efficacy of the waters alone was almost as great as that of the Aix waters, plus the drugs, had been. The eliminative process seemed so thorough as to remove the toxic products without other aid than that of the waters. The wonderfully vivifying influence of the desert air was well borne out by that captivating book by Hichens, entitled "The Garden of Allah." When comparing the Biskra desert air with that at Assouan and Helouan, the greater amount of wind at Biskra

made the value of the treatment there somewhat less, and Assouan was, in his view, superior to Biskra in several other respects ; so that he would put the three places in the following order of merit: Assouan, Biskra, Helouan. The conditions seemed most dependable at Assouan, and there the social element was strongest. It was not easy to persuade English people to stay long enough at Biskra to secure the success the physician desired, because there was so little social encouragement. At Assouan and Luxor, however, the social opportunities were very great. Physicians were beginning to recognise the value of the desert treatment, and a good service was being performed in bringing the subject before the Society.

Dr. ARMSTRONG (Buxton) said that during the past winter he had carefully observed the desert climate of Egypt with the idea of forming some estimate of its medical possibilities, and Dr. McClure's paper had, therefore, interested him greatly. On the whole, Dr. McClure's observations coincided with his own ; but he thought it would not be out of place if he mentioned a few practical points in reference to desert climate, which he would limit to Egypt. Cairo was a great city, having very little rain and much sunshine. Within eight miles of it was Mena on the edge of the desert and close to the pyramids. There was cultivated land on one side and desert on three sides. Helouan, a small town, fifteen miles from Cairo, had sulphur waters and baths. It stood in the midst of the desert with no vegetation except such trees as were planted in the streets. The difficulty about desert therapeutics so far had been chiefly one of expense. It cost £2 per head per day to camp right out in the desert, even if two or three people joined. It was necessary to have tents, camels, servants ; but for people who could afford it results were remarkable. During the latter part of the past winter a small combined camp was organised by a lady who had much desert experience. The cost was seven guineas per week. It met with considerable success, the medical results being excellent. Cases of rheumatism and atonic gout did remarkably well. Arthritis, especially of

the neural type, did excellently, and the same was true of neuritis, especially the class who might be said to have "mental neuritis." Cases of asthma and of early phthisis showed good results. As Dr. Symes Thompson had said, much dust was present in some parts of the desert, but getting further out the soil appeared to be heavier, and, except in sandstorms, which were very infrequent, no inconvenience arose from it. He had formed the opinion that better results could be had from the Egyptian desert than from Biskra. He thought that future health resorts would be in the Khartoum district. At No. 6 station, between Wady Halfa and Khartoum, there had been wonderful cures of phthisis on a large plateau, 2,000 to 3,000 feet above the level of the sea.

Dr. THEODORE WILLIAMS said he had attended with the idea of hearing something about the climatology of the Sahara, but instead he found Dr. McClure's paper consisted largely of a "feast of reason and a flow of soul." Personally he could not perceive the splendid effects described—the blue rays and red rays—and he regretted that his mental spectrum was so limited. He feared he had not mastered every part of the poetical effusion. But the subject was very interesting, and he felt much obliged to Dr. McClure for bringing it forward. He was expecting to hear about the institution known as the Bureau Météorologique, of Algiers. Observations were taken there most systematically by the French Government. There was an excellent director of the institution—M. Thévenet—and a thick volume of observations was issued every year. There were seven stations in the Sahara in connection with that institution, one of which was Biskra. He had been hoping to hear Dr. McClure's conclusions, whether one part of Algeria was better than another. He (Dr. Williams) had also visited Biskra, and was very much interested in it. During his short stay there he had been fortunate enough to see the famous mirage, and it was most remarkable; palms and other objects were seen quite distinctly, and then they vanished. His experience of deserts was based upon visits to Egypt, Biskra and the Great

Desert of North America. One district of the latter was the most remarkable of all, the desert of Southern California, lying between that State and Arizona. It comprised what was known as the "Death Valley," where some of the highest temperatures in the world had been registered. It was evidently a continuation of the Gulf of California, and at some period there must have been an upheaval, by which that part was separated from the Gulf. Its marine origin caused it to be a great source of saltpetre. There was also Fort Yuma. A tale was told of this fort which is garrisoned by the American Government on the borders of Mexico. A subaltern was quartered there who was reputed to have lived anything but a respectable life. He became very ill and about to die, and the general impression was that he was destined for a certain warm place. He died and was buried. On the following afternoon one of the troopers came to the commandant and said, "Lieutenant Jones is standing in the quadrangle, Sir, what am I to do?" "Nonsense," was the reply, "we buried him yesterday." "He has come back, Sir, and he wants to see you." "Well, Jack," the commandant said to the deceased officer, "what do you want?" The reply was, "I have come back for my top-coat!"

Returning to the subject, the great feature of the desert was the extremes of temperature experienced—the great heat in the day and the cold at night. One felt the cold intensely in the desert, and it always seemed more pronounced than at other places because of the day heat. In the morning the acacia trees and other vegetation would be found dripping wet, on account of the heavy dew. Also in some places there was great dryness, and the difference between the bulbs was enormous, amounting up to from 20° F. or 30° F. in some places. There was an exhilarating effect about the air which made one feel ready to do anything, and the heat was not felt so much as in places where there was vegetation. What was the good of the desert climate? He agreed with much that Dr. Armstrong had said. There was no doubt about it being good for a number of complaints. He had seen very good results in forms of rheumatism, and—what had not

been mentioned—spasmodic asthma. People subject to the latter who visited the desert seemed to escape the attacks altogether for the time. With regard to phthisis, the desert suited a certain number of cases, but taking the disease generally, he did not think the effects of desert residence were so pronounced as those of some other climates, such as high altitudes. An early case of phthisis would remain about the same in the desert climate; there would not be the same progress forward as in cases sent to Davos and similar places, St. Moritz and Colorado. Cases of phthisis returning to him from the desert presented much the same physical signs as those they went with, but slightly less vigorous in health. But for chronic bronchitis, chronic asthma, rheumatism, &c., the desert acted marvellously; patients ceased to be patients; they lived their own lives, and astonished one by their powers of exercise, &c. Unfortunately, availing one's self of the desert climate was always an expensive business, though Biskra was much cheaper than Egypt. He believed the expense was largely the fault of the Briton. Assouan, one of the most charming health resorts, was also one of the most expensive. He believed that if the bull were to be taken by the horns and an expedition with tents organised, the expense could be much reduced, even below the figure given by Dr. Armstrong. But of course one must get away from the dragoman. He had known people in the Luxor region who used to live out in tents. They spent very little money, and went into Luxor for their provisions. They did not live luxuriously, and they might have added much to their comforts by a slight expenditure. People lived very fairly in those conditions on as low a figure as a couple of hundreds a year, if they understood the language and bargained on their own account. The dragoman wanted something like 50 per cent. for his trouble. The desert climate was certainly one of the finest going, and the Egyptian desert climate was very fine in every way. He had heard a great deal against the winds at Biskra, but there were good hotels, and the place was well organised, having a railway and other facilities. He thought a great deal might be done in that region. He hoped the object of members of

the Society would be not only to preach the doctrine of the desert climate, but to do what they could to place it more easily within the reach of patients of moderate means. At present the expense prohibited many people from going there, but if good organisation were brought to bear, the desert climate could be brought within the reach of the lower middle class.

Dr. LEONARD WILLIAMS remarked that he wondered whether he was at the red or at the violet end of the spectrum, and whether Dr. McClure was one of the ethical figures one saw in the mirage of the desert. He had not been there and after the author's description of the psychical side he was not quite sure it would be desirable for a sensitive person like himself to go. He hardly thought the paper should have been read to such imaginative young men as the members of the Society; it seemed more suitable for an association of people with invulnerable nerves. But when the author left the meta-psychical side and spoke of what the ordinary plain man could understand, he (Dr. Williams) found the communication exceedingly interesting. If Dr. McClure had been present at the last meeting of the Society, he would have heard something more about the subjective method proposed by Mr. Tyler. Dr. Buckley, of Buxton, had discussed the matter in a paper which he recently contributed. The impression which he (Dr. Williams) had gleaned from the present paper and the remarks of those who had spoken on it was that the desert climate was a superlative example of a bracing climate. The air was dry, the ranges of temperature were considerable—great heat by day and great cold at night—and if more people had heard what had been said on the subject of the desert they would not so often describe the desert climate as dry and equable as was so often seen in text-books on general medicine. It generally occurred in connection with rheumatoid arthritis, the writer saying that the patient should be sent to a dry, equable climate, such as that of the Egyptian desert. A climate could no more be both dry and equable than a solution could at the same time be acid and alkaline. In the latter part of Dr. McClure's

paper, in which he took his hearers into the heights, one's feet were certainly on the floor, but one's head, like those of the palm trees referred to, was in the highest heaven. Yet there was one touch of human nature, namely, where the reader said he conceived it possible that visceral sensations might be pleasant. Lord Byron said he felt better after calomel than after anything else, and probably a good many people felt better after alcohol than they did after bread and butter. Dr. McClure had also referred to a remark which he (Dr. Williams) made to him in private, that the psychic effect produced was not a matter of climate, but of food. He still thought so, and that the nature of the sermon—whether it were optimistic or pessimistic—would depend largely on the state of the digestive organs. He desired to say a word about the effect of the climate of the Egyptian desert, *i.e.*, of a superlatively bracing climate, upon increasing metabolism in the way described by the speakers, namely, by accelerating and favouring elimination from the skin and lungs. In all humid climates, elimination by the skin and lungs was depressed, and that might be very undesirable under certain normal circumstances, but he still thought that relaxing climates had their value, and that the indiscriminate recommendation of bracing climates was very dangerous, particularly in such conditions as chronic bronchitis, especially when accompanied by emphysema, and in chronic diseases of the kidney. Removal of fluid by skin and lungs took off work from the kidneys. In the old days, when acute nephritis used to be treated by starving the patient of water, the patient died; and when the opposite plan, that of flushing out the kidneys with fluid, acute nephritis was recovered from. He believed that was so with many cases of chronic nephritis, whether granular or otherwise, and one practically starved the kidneys of water when removing the patient from an ordinary humid climate, where the kidneys had fair work, to a very bracing climate, where much of the excretory work was relegated to the skin and lungs.

Dr. LEON (Southsea) said he agreed with what Dr. McClure said about the exhilarating effect of the desert air. Certain classes of cases did extremely well, but the kind of case had

to be carefully chosen. He agreed with Dr. Theodore Williams that all cases of phthisis by no means did well in the desert. He happened to have been at Biskra six weeks ago and the cold winds towards evening were terrible. The Biskra baths were about three miles from the town, and about 5 p.m., when on the tram returning from them, the wind became very cold indeed. The chief constituent of the water was lime salts—sulphate of lime and some sodium chloride—and the ladies were all grumbling about their complexions. It was impossible to wash with satisfaction and shaving was a painful operation. The accommodation at Biskra was good and the place did not seem to be expensive, not nearly so expensive as Egypt, judging by what he had heard. It could be reached in about seventy hours. But patients who went there must be prepared to put up with a certain amount of monotony, more than in Egypt, according to what other speakers had said.

Dr. FELKIN said it was just four or five years ago that he suggested to the Society the plan of sending patients to the desert. He still maintained that it was better to get them away from Cairo and the ordinary health resorts, with their distractions and rounds of amusement. At many health resorts he believed much harm was done to patients and their recovery retarded by the gaiety, the excitement, the bridge playing, &c. He believed Dr. Armstrong was right about the plateau near Khartoum, which he mentioned. He (Dr. Felkin) had had his eye on that part of the world for over twenty years, feeling sure it would be an admirable place for phthisical patients. He had had a considerable experience of the desert and remembered his own desert journeys in Khordofan and Darfour, and although there was exhilaration, a time came when that gave place to loneliness and depression, which might be serious. The psychic results to which Dr. McClure alluded were of the greatest interest, and he had always paid some attention to them. The desert air and life, its heat by day and cold by night, had a very marked effect upon the brain and imagination. If one called to mind the lives of the old saints, who used to live in the deserts, especially the

Alexandrian saints, one could not doubt that the isolated conditions in which they lived gave rise to much of their exalted mental activity, which was the cause of many of their "visions." He agreed with the remark that rheumatism was benefited by desert air, and with the very interesting remarks of Dr. Symes Thompson on the waters of Biskra and syphilis. He came across the same thing, but in a different way, in Khordofan and Darfour. He did not know of any mineral waters there, but it was well known that those who got syphilis from the Arabs on the White Nile went to the regions of Khordofan and Darfour to get rid of it. He saw a great deal of secondary syphilis there and it was apparently rapidly recovering, solely by means of the desert air, as far as could be judged. His own impression of cases of neurasthenia, or the majority of them, and also cases where one noticed a slight mental twist in the patients, persons who were overworked or had been studying too much, or had become run down by business anxieties or society life, was that six weeks' or two months' real isolation in the desert would be the best method of treatment procurable.

Dr. SYMES THOMPSON, in further remarks, said there was good reason to believe that the desert between Khartoum, Fashoda and the great lakes would undergo great development in the next decade; and not only would there be an inrush of civil servants, but there was a large missionary movement on foot which would probably lead in a short time to a considerable influx of missionaries to that region, where the mission work would perhaps be as markedly successful as in Uganda, where the success of the missionary had been so extraordinary.

Dr. HARRY CAMPBELL said he was glad to hear Dr. Felkin backing up Dr. McClure in regard to the psychic influence of the desert. The physician should keep this psychic influence well before him in prescribing change of climate. He supposed most would agree that the benefit derived from health resorts worked chiefly through the nervous system. Physicians would be the more ready to accept that proposition upon reflecting that the human organism was little more than a

nervous system, at the end of whose efferent nerves were so many non-nervous cells, notably muscle and gland cells. Each individual muscle cell, and probably every gland cell, was provided with a nerve twig. Another proposition he wished to advance was that, upon ultimate analysis, it would be found that health resorts benefited essentially through their influence upon the digestive system. Given a normal blood plasma, one which contained the proper proportion of normal constituents, and the minimum of poisons, the individual would perforce feel well. Now upon what did the constitution of blood plasma depend? Essentially upon the digestive organs. He thought the Society might fittingly discuss some day the physiological means by which health resorts produced their good effects. He believed that the more the matter was thought over, the more it would be found that the good was achieved essentially through the digestive organs, including, of course, that most important organ, the liver.

Dr. PERCY LEWIS (Folkestone) congratulated Dr. McClure on his paper; the author had given the members a thought in advance in his allusion to the psychic effects of the Sahara. It also applied a great deal to health resort treatment in general, because undoubtedly much of the beneficial effect of health resort treatment was through the mind. He believed the present was the first occasion on which that aspect had been brought prominently forward. Several speakers had taken the matter up, but he believed Dr. McClure would go even further. He seemed to have read his "Myers" well. He (Dr. Lewis) had also read it, and thought it should influence the practitioners of every branch of medicine and surgery. It was a point which required emphasising, and he hoped that in future discussions members would sympathise with the idea and develop it.

Dr. MCCLURE, in reply, said he believed there were no questions to answer. He was very glad he had been able to call forth the illuminating remarks which had been made by various speakers. He had himself felt that a portion of his paper might strike some members as being a little unusual. Perhaps the mental attitude was a little trans-

cidental, he would try next time to attune it more to Dr. Leonard Williams' utilitarian state of mind. He was glad there were some people who did not think the psychical problem ought not to be investigated. To his mind it was one of the greatest problems in medicine, and when more light was thrown on what he had called the "mental spectrum" it would be a great help in medicine and surgery. In conclusion, he thanked members for the patience with which they had listened to the paper.

EXCURSIONS TO BIARRITZ, PAU, CAUTERETS, ARGELES, SALIES-DE-BÉARN AND ARCACHON.

BY FREDERICK J. MCCANN, M.D. EDIN., F.R.C.S. ENG.

ON Sunday, May 14, a party numbering forty, composed of British physicians and surgeons, accompanied by several ladies, left Paris in a special saloon carriage for Biarritz. The weather being all that could be desired, an excellent view of the surrounding country was obtained, and *la belle patrie* in all its springtide freshness seemed to breathe forth a joyous welcome. The comfort of the travellers was enhanced by the provision of an excellent *déjeuner* and dinner, served during the journey.

Biarritz was reached at ten o'clock on Sunday evening and carriages were in waiting to convey the visitors to the casino. All Biarritz turned out to welcome her guests, the approaches to the casino being lined by enthusiastic crowds. The town itself was illuminated and a salvo of cannon was fired on the arrival of the visitors. The guests, on alighting at the casino, were received by the Maire, M. Faisans, who cordially bade them welcome in a felicitous speech, to which Director-General A. H. Keogh responded. Refreshments were partaken of at the casino and *l'entente cordiale* was toasted.

On the following morning the assembled guests, accompanied by the Maire and the municipal councillors, drove in special carriages to the Thermes-Salins de Biarritz. The arrangements of the bath were explained and the excellence of the organisation was much admired. A visit was then paid to the golf club, where refreshments were offered and where a photograph was taken. The visitors re-entered their carriages and were driven along the *plage*, whence an excellent view of the wide expanse of the sea-front was obtained. A visit was paid to the English club, where refreshments were again provided, and then the guests returned to the Palace Hotel, the former Palace of the Empress Eugénie. A sumptuous *déjeuner*, to which a large company had been

invited, awaited the visitors on their return. A military band, sent specially from the garrison at Bayonne, discoursed sweet music during the repast. The Maire presided over the assembled company, and in a graceful speech welcomed the British visitors. Director-General Keogh and Mr. J. A. Bloxam responded.

After the *déjeuner*, the visitors left for Pau, which was reached about 6 p.m. A banquet was given at the Winter Palace, under the presidency of the Maire of Pau, who welcomed the visitors. Amongst the guests were the Préfet of the Basses-Pyrénées and H.B.M. Vice-Consul. A concert of vocal and instrumental music followed the dinner and the excellent choral singing was a feature of this entertainment.

On Tuesday morning motor cars were placed at the disposal of the party, and a visit was paid to the Chateau of Henry IV., which contains some fine old tapestries. The guests were then driven into the country to visit the kennels and golf course. *Déjeuner* was provided at the Hôtel Gassion and the Hôtel de France.

Leaving Pau by train at 2 p.m., the party journeyed to Cauterets, which was reached at 3.30 p.m. A beautiful view was obtained of the snow-clad peaks of the Pyrénées, and the wonderful vegetation, extending upwards almost to the snow-line. The reception at Cauterets was picturesque and in keeping with the magnificence of the surroundings. On the platform the Corps of Guides was drawn up in line, accompanied by their band, which played the British National Anthem as the train drew up. The Guides, in their pale blue uniform with white leggings, presented a striking appearance. They were medium-sized, thick-set, bronzed mountaineers, who, from their physique and bearing, were evidently accustomed to feats of endurance. The Maire of Cauterets received the visitors, who then drove in procession, headed by the Guides, to the hotel where tea was served. They then embarked on the electric railway and afterwards journeyed in carriages to the Pont d'Espagne.

Cauterets, from its situation and climatic advantages, deserves to be more widely known in this country. It is

situated at an altitude of 935 metres and is surrounded by lofty mountains, the snow-clad summits and luxurious vegetation of which add to the grandeur of the scene. Indeed, a trip up the mountains on the electric railway discloses a scene of magnificence and grandeur which leaves a lasting impression on the traveller. At the Pont d'Espagne a fine view was obtained of the rushing torrent which takes its source in the Lac de Gaube. The approach of a mist prevented the party from extending their excursion to the Lac, but all returned to the hotel delighted with the wonderful panorama.

The best efforts of Dr. Meillon had been directed to giving the guests an excellent banquet on their return. The Maire of Cauterets again welcomed the visitors and suitable replies were made. After dinner some capital photographs were shown on the lantern by Dr. Meillon. These illustrated the experiences of mountaineers in this region, and the lucid explanations given in English by Dr. Meillon added greatly to the value of the photographic exhibition. Dancing was also enjoyed and formed a fitting conclusion to one of the most enjoyable days of the tour.

On Wednesday morning an early visit was paid to the thermal establishment and an opportunity was afforded to try the sulphur waters. These waters are specially suited for catarrhal states of the nose, throat and air passages, and have already obtained considerable renown ; but time pressing, a start had to be made to catch an early train to Argès, after an affectionate *au revoir* to Dr. Meillon and his father, and to the Maire of Cauterets. Every member of the party felt the warmth of their welcome to this picturesque spot, the pure clear air of which had, even in the short time, produced its invigorating effect, and where everything had been done to add to their comfort and enjoyment. A word must be said of the great kindness of Dr. Meillon, who, alike as travelling companion, guide, lecturer, and last but not least, pianist, showed his remarkable versatility and was indeed a "host in himself." He will be sure to have an enthusiastic welcome when he comes to London.

After arriving at Argès the party visited the Medical

Institute, where the apparatus for the treatment of orthopædic cases was exhibited, and they were later entertained at *déjeuner* at the Hôtel du Parc, which is prettily situated in a wooded garden. Speeches were made by the Maire and others. The intelligence that the Préfet of the Hautes Pyrénées was prevented from attending by an accident to his child was received with great regret. The Sous-Préfet, by his cordiality and *bon-homie*, endeared himself to all the members of the party and proved an excellent substitute. His health was proposed and drunk with enthusiasm.

A drive of five miles through a beautiful bit of country took the party to Lourdes. Here a hurried visit was paid to the grotto, the sacred pool and the church. The party then left by train for Salies-de-Béarn, where they were met at the station by the Maire, Dr. Matton and other medical men. They were conducted over the salt-works and the thermal establishment. Dinner was served at the different hotels and afterwards a reception was given at the thermal establishment, followed by a concert. Speeches were made by the Maire and others, and a most enjoyable evening was spent. Some of the party left for Paris, while others remained for the night at Salies-de-Béarn.

The town is situated in a Pyrenean valley and is much used as a health resort by the French and Spanish, but is not sufficiently well known in the British Isles. The climate is mild and sedative, being well suited for convalescents and nervous patients. The bromo-iodine salt springs have already obtained considerable reputation in the treatment of tubercle, anæmia and other disorders.

Mr. Rose, the proprietor of the Grand Hôtel du Château, rendered great service to the visitors during their sojourn at Salies. Dr. Matton, of Salies, to whom the idea of having this tour to the south of France was mainly due, did everything in his power to promote the comfort and enjoyment of the guests.

Some of the party journeyed on the following day to Arcachon, where a delightful afternoon was spent in viewing this charming health resort. A cordial invitation was extended

to them to remain another day and enjoy the hospitality offered by M. de Galne (Président du Syndicat d'Initiative), Dr. Festal and M. Ferras (Members of the Administrative council). In the evening the party returned by train to Paris, arriving next morning at the Quai d'Orsay.

Thus terminated one of the most enjoyable tours which has ever been organised. To say that the journey through France was a triumphal progress is no exaggeration, as the kindness and hospitality of the towns visited were beyond all praise. Many graceful compliments were paid to the visitors by their French hosts and many new friendships were made. The ladies of the party were specially favoured with presents of choice flowers during the journey.

Among the large number of those who aided in making the visit such a pronounced success, special mention must be made of the Préfet of the Hautes Pyrénées, the Sous-Préfet of Argèles, the Président of the Vallée, the Director of the Funicular Railway (who had travelled specially from Paris), the Maire of Cauterets, Dr. Meillon and his father, and last but not least, Dr. Matton. The aid given by the British authorities was also much appreciated. The party was under the charge of Dr. Leonard P. Mark, of London, an accomplished French scholar, whose uniform courtesy and tact made him popular with all members of the party. Acting as spokesman and interpreter, his services were invaluable.

Vive la France ! Vive l'entente cordiale !

FRENCH HEALTH RESORTS.

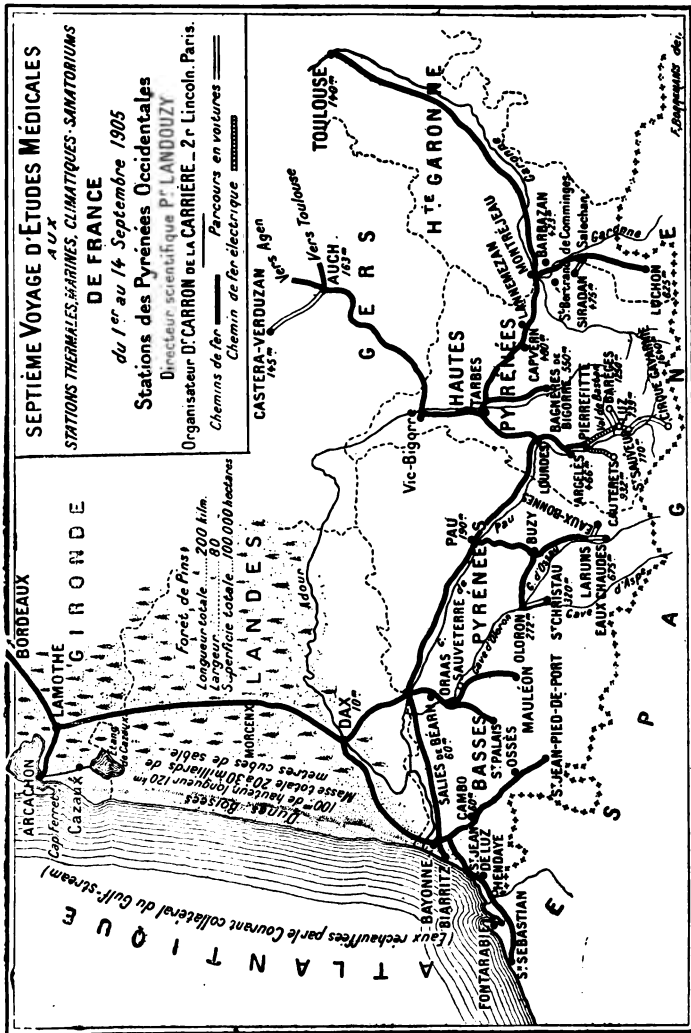
ANNUAL VISIT OF MEDICAL MEN AND STUDENTS. VOYAGES D'ÉTUDES MÉDICALES.

THIS year's visit, the seventh "Voyage d'Études Médicales," will comprise the most important stations in the Western Pyrenees. It will start from Luchon on Friday, September 1, and terminate at Arcachon on Thursday, September 14. The price to be paid, which includes everything between these two places, is £12. There are no extras of any kind. The travelling is by first class special train, and the accommodation is the best which each place has to offer. In order to reach Luchon, a ticket (first or second class) at half price will be issued from any selected point on French territory, and a similar reduction will be made on the ticket from Arcachon to the point of departure from French territory.

The district to be visited is remarkable for its extreme beauty and interest, and the stations for their therapeutic value. Among them are such well-known resorts as Luchon, Cauterets, Saint-Sauveur, Eaux Bonnes, Pau, Biarritz, Dax and Arcachon, together with many of minor importance. The particular features of each place will be briefly described by Dr. Landouzy, Professor of Clinical Medicine at the University of Paris.

Medical men (who may be accompanied by their wives), medical women and students in medicine are eligible to take part in the trip. Names must be sent in so as to reach Paris on or before August 15. They should be accompanied by the subscription (£12), which may be in the form of an ordinary English cheque, payable to Dr. Carron de la Carrière, 2, Rue Lincoln, Paris, or to Dr. Leonard Williams, 8, York Street, Portman Square, W., from either of whom a detailed programme of the tour, giving all necessary information, may be obtained.

We cannot too strongly recommend this tour to English medical men, as a pleasant, bright, enjoyable and very inexpensive holiday. It has been proved in former years that



from the beginning to the end of the tour everything was done to secure the greatest amount of enjoyment and comfort to the members of the party, and that the kindest hospitality was shown by the various towns visited.

A report of the visit of English doctors to Biarritz, Pau, Cauterets and other places, in May last, after the visit of British physicians and surgeons to Paris, will be found in another part of this issue of our Journal, and will give an idea of the sort of delightful holiday one may expect by joining the forthcoming party of visitors to the health resorts of the south-west of France in September next.

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL
SOCIETY.

ORDINARY MEETING.

HELD at 20, Hanover Square, London, on Wednesday,
March 8, 1905, Dr. BOWEN DAVIES, President, in the chair.

Dr. LEONARD WILLIAMS opened a discussion on "The
Ethics of Health Resort Practice."

Ordinary Meeting held at 20, Hanover Square, W., on
Wednesday, April 19, 1905, at 5 p.m., Dr. BOWEN DAVIES,
President, in the chair.

Dr. HENRY MCCLURE read a paper on "The Climatology
of the Sahara."

Reviews and Notices of Books.

A SYSTEM OF CLINICAL MEDICINE. Vol. ii. By Thomas D. Savill, M.D.Lond. (London: J. and A. Churchill. 1905.)

The issue of the second volume of this book, which has been too long delayed, will be welcomed by all those who have made acquaintance with the first. The subjects which it comprises are Certain General Disorders, Diseases of the Skin and Diseases of the Nervous System. So far as the last two are concerned, they are dealt with as, from his intimate personal knowledge of both, we should expect Dr. Savill to deal with them, namely, clearly, succinctly, and, so far as the limits of space and the scheme of the book would allow, exhaustively. Skin affections do not, of course, lend themselves easily to verbal descriptions, they demand, more perhaps than any other branch of study, clinical observation and personal experience, but in so far as the subject is to be learned from books, Dr. Savill may safely be accepted as a sound and careful exponent of its elementary principles.

That portion which is devoted to the nervous system constitutes a great advance upon what usually appears on this subject in the majority of text-books. It is no reflection upon other works to say that the scheme of Dr. Savill's book lends itself to the exposition of neurological questions in a manner which is quite impossible in one whose essence is cut-and-dried description of individual maladies. In the view of nervous diseases here presented there is a breadth which, by the associations and contrasts between the various clinical states, invites to a truer conception of neuropathic processes than can ever be obtained by a scheme which is forced to treat every clinical entity as if its individuality were pathological as well as clinical. Nor does the clinical aspect suffer by this presentment of the subject. It is no uncommon thing to find a practitioner who is otherwise well equipped and up to date behaving as if in a strange territory when face to face with a case of nervous disease. This appearance of unfamiliarity could scarcely attach to any one who had mastered Dr. Savill's very simple and clearly expressed directions as to what to look for, how to look for it, and its significance when found. There is necessarily, here as well as elsewhere in the book, a great deal of condensation, but the outlines are excellent, and such details as are given are helpful in the highest degree.

We sincerely wish we could say as much in praise of the author's treatment of that portion of this volume which deals with "certain general disorders," as we feel he is entitled to in respect of the two portions already referred to. It resembles the proverbial egg, in containing parts which are excellent, but it also resembles it in containing others to which such an adjective cannot be legitimately applied. Among the former we may call special attention to the opening section on general debility, pallor and emaciation, and more especially to that portion of it which deals with the examination of the blood. This is certainly superior to what is to be found in the ordinary text-book, even in the ordinary clinical text-book, which is thoroughly up to date. Another particular in which the book is in advance upon the ordinary text-books is that it deals under each disease with the manifestations of that disease as they differ in children and adults. This is a most important matter, which is frequently absent from general text-books and is very often overlooked by the student. Among the latter is a section which is of paramount interest to readers of this Journal, namely, that which deals with gout and rheumatism and their congeners. For here we find the author lacking in a quality which he displays, albeit in a thoroughly restrained and scientific manner, in the other portions of the book, namely, imagination. His classification of chronic joint diseases under nine heads is, to say the least of it, unilluminating, and to the minds of many it must appear positively confusing. Nor do we find ourselves very much in accord with the table of diagnosis between chronic rheumatism, chronic gout and rheumatoid arthritis, either in the necessity or even desirability of such a table, or in the would-be distinctive details which there appear. If the term chronic rheumatism means anything at all, it means the chronic state of that morbid condition whose acute state is rheumatic fever, and it is reasonable to expect from a modern text-book that it should emphasise the fact that such a state has no existence, that, in fact, the manifestations which have been erroneously described as such are, in reality, due either to gout or to rheumatoid arthritis. In perusing this section we have felt, with increased force, the objection to the introduction of the therapeutic element into the scheme of the work (an objection which we expressed when noticing vol. i.), for we find that the climatic and balneological recommendations do not attain to the otherwise high standard of the book. Where it is impossible to enter into such matters in some detail it is best to omit them altogether.

These are, however, minor matters in a book which perforce deals with the whole wide range of medicine, especially where the more recondite portions yield evidence of so much breadth of view, so much industry, and so much lucidity of

exposition. Regarded as a whole, Dr. Savill's "System of Clinical Medicine" seems destined to take a high place among the classics of medical literature and to earn the confidence and enjoy the popularity of several generations of students; and we look forward to a time in the near future when we shall be able to announce that such few demerits, as by a careful examination we have been able to detect, have disappeared from a subsequent edition.

THE MAINTENANCE OF HEALTH IN THE TROPICS. By W. J. Simpson, M.D., F.R.C.P., Professor of Hygiene, King's College, London, &c. (London: John Bale, Sons and Daniels-son, Ltd. 1905.)

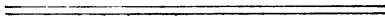
This little handbook has been prepared especially for the use and guidance of the general public. It is published under the auspices of the London School of Tropical Medicine, and is intended as a manual of reference for all residents in or visitors to tropical and sub-tropical parts of the Empire. It is well printed on good paper and is exceedingly portable. The subject-matter embraces all that the ordinary layman should know in connection with the avoidance of disease and the treatment of such conditions as are the direct result of the influence of tropical climates.

The first three chapters deal with what we may call personal hygiene—exercise, bathing, clothing, diet, the dangers of drinking water, the dwelling house, and the like. The advice on all these matters is exceedingly good and practical. It would be a good thing if visitors to the Tropics were to take to heart Dr. Simpson's admirable advice in the matter of heavy luncheons and heavy drinks in the middle of the day and the dire results which ensue from the ridiculous practice of eating large quantities of meat. In all matters of this kind the wise man studies the habits of the native; and when we remember that the majority of the natives in all tropical and sub-tropical climates obtain their nourishment from farinaceous foods and fruits, it is difficult to understand how so many of our own countrymen, who pride themselves upon their intelligence, can continue to try and live in Bombay as they are in the habit of living in Piccadilly.

We should have been pleased to see something more emphatic from Dr. Simpson on the subject of clothing. He insists, very rightly, that it should be light and porous, but he does not appear altogether to have divested himself of the elementary fallacy that wool is the proper thing to wear next the skin. He shows a predilection in favour of silk, and is by no means ill-disposed toward cotton, but he does not point out, as we think he might profitably do, that wool is quite unabsorbent, and that when it has been washed a few times it becomes of the consistence of ordinary felt.

The advantages of the cholera belt are very suitably dwelt upon ; and though we do not approve of flannel undergarments, we cordially agree with Dr. Simpson that the cholera belt, worn outside the ordinary garments, is practical and necessary to the European who dwells in tropical and sub-tropical climates.

We have the greatest confidence in recommending this book to the notice of such of our readers as have patients or friends who are likely to visit the Tropics. Certainly, every young man going to India for the first time should make a careful study of the very excellent advice which he will find in this little manual, and if he keeps it by him for reference, he will save himself a great deal of unnecessary pain and suffering.



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THE LIMITATIONS OF TREATMENT.

BY WILLIAM MURRAY, M.D., F.R.C.P.

Consulting Physician to the Newcastle-on-Tyne Hospital for Sick Children.

GENTLEMEN,—I know but little of the climatological or balneological sciences, so that I should have been obliged to decline the honour of addressing you if Dr. Leonard Williams had not given me a wider scope for the remarks I am about to offer.

Among the various difficulties which beset the pathway of treatment, none are greater than that of determining "how far we shall go." When to stop, when not to stop, and how strong or how moderate the means we are to use, are problems about which no definite rules can be laid down, and it passes the wit of man to lay down general rules for that which must be dependent on the skill, insight, common-sense and experience of each one for himself. To put a certain limit on treatment, merely because the books say so, often spoils the experiment and defeats our objects.

On the one hand, we may err by beginning with too heroic

a dose ; on the other, we may fail because we lack the courage to give enough. Let me give you some illustrations of these difficult problems.

SYPHILIS.

Take the case of syphilis. Suppose we have to deal with this disease in a delicate young man or woman. If we push our remedy too far or make it too decided, we may injure the constitution of our patient and probably not cure the disease. Only the man who fully realises what may happen in such a case can be fully alive to the importance of "feeling his way." Noting the effect of treatment, first on the patient and then on the disease, pushing the treatment when the symptoms do not yield, withholding it when the patient indicates an intolerance of the remedy, until by a series of zig-zags we arrive at our goal. This is what I call limiting our treatment. I can now recall the cases of several young fellows with a fine physique, but underneath this outward shell lay dormant a constitutional inherited predisposition. In each case a severe course of mercury pushed to profuse ptyalism was followed by death from Bright's disease or phthisis. I have, since this remote time, seen many other similar cases treated by mercury with proper limitations, and without laying bare the soil for the seeds of other diseases. On the other hand, there are cases where the most persistent efforts are demanded of us, giving as much mercury and as long as the patient will stand it, until the disease is cured. If we do not do this, we shall not cure the disease by half-hearted measures. Let me quote a case : A strong, beautiful and healthy young woman contracted syphilis from her husband while she was pregnant. As usual in these cases, no notice was taken of the primary disease until a diseased child was born. (I might here note the difficult position of the medical attendant when his mouth is shut by the husband and he has to urge the patient to a long course of treatment without his being at liberty to say *why*. How difficult to succeed in doing this, when the patient has apparently got well during a lull in the symptoms ; the patient will not then

take any more medicine, and the whole thing has to be done over again.) All this occurred in my patient's case, and, in spite of desultory treatment at the hands of one and another, at the end of two years she presented a horrid spectacle. Her legs and feet were covered with foul excavating ulcers, her head, ears and lips were the seat of huge crusts of rupia, and her nose end had been destroyed. I treated this case for two years by alternate courses of mercury and iodide, but it was not successful; as soon as I withheld my treatment or put a limit to the remedies the patient got worse. Five to six years ago I made up my mind to try my remedy without a break, until a decided and permanent result was obtained. A grain of blue pill, a grain of quinine, and one-sixth grain of opium was given steadily three times a day for more than five years. During the earlier part of this period the whole of the bones of the nares were exfoliated or removed. At the end of four years all active symptoms ceased, but I did not stop the treatment until a few months ago, she having taken about 7,000 grains of blue pill and thriven on it. She is now (although maimed and disfigured) in excellent health and apparently cured.

I hardly like to dwell further on this gruesome subject, but its pathetic side strikes me forcibly. This terribly injured, patient woman, clinging with grim determination to her pill *ter die* without fail for five years. If I had not limited my first efforts to a "three months' course of mercury," followed by futile courses of iodides, much time at least would have been saved. Nothing short of this long course of steady treatment saved the situation for us.

A PRACTICAL HINT.

Before leaving the subject of mercury, let me give one practical hint. If in doubt as to the amount of calomel or grey powder we shall give to a child, lay bare the nates, and if you find them thin, flat and flaccid, give but a small dose. If, on the other hand, its little gluteal regions come together like the chubby cheeks of a cherub, you need have no fear of a free dose.

TOLERANCE.

Time would fail me to speak of the limitations of such drugs as opium, quinine and digitalis. All of them should be given under the guidance of the principle that "the need for the medicine establishes its tolerance." Extreme pain tolerates a large opiate, a high temperature endures full doses of quinine, and a weak heart craves for a good many drops of tincture of digitalis ; doses which in health or unsuitable conditions make the patient ill and intolerant of the remedy.

With regard to alcohol and its limitations, it is almost dangerous to speak nowadays. We can so easily err by defect or by excess, and both the public and the profession are waiting for some well-defined rules. When to use it, how to use it, when to push it freely and when to withhold it altogether, are still unsettled questions.

NEW TREATMENT ONE-SIDED.

Looking at this question from another aspect, I cannot help noticing how often we are carried away by a new idea which absorbs the whole treatment to the exclusion of old-fashioned remedies ; they are, so to speak, cut out. We thus limit our treatment and discard the valuable remedies once in use. Is not this the case with phthisis treated in and by sanatoriums? Are we not in danger of trusting to them too much? and do we not tend to lose sight of valuable aids to treatment, such as the old-fashioned hypophosphites of lime and soda of Churchill? Let me give you a case which was apparently cured while treated by Churchill's hypophosphites. A gentleman in feeble health had a fairly large cavity in the left apex, but the cavity was mostly in a quiescent state. I advised him to take 5 grains of each of these hypophosphites three times a day and stick to them as his only treatment. At the end of fifteen months he brought me a half-ounce box nearly full of calcareous matter which he had expectorated in pellets. A little flattening indicated the site of the cavity, over which the breathing was almost normal. He was also without cough or expectoration, and lived for a good many years in fairly good health. I think, therefore, we shall err in trusting to the new

treatment only, and it is our duty to insist on it being supplemented by proper and persistent medicinal administration.

ACUTE FEBRILE DISEASES.

There are no diseases where the limiting of treatment is more important than in the acute febrile class. We have to watch their progress as a man watches his patient under chloroform, giving a little more now, withholding a little then, until the patient is safely tided through a crisis. Nor must our efforts be limited to the convalescent stage of these diseases. This is where I have seen many devoted men fail. They pull their patient through with rare skill and untiring energy, and then leave him to his own devices, forgetful of the phthisis which may follow enteric, and the nephritis which may follow scarlet fever, and the many ills that body and mind are heirs to after influenza.

ARSENIC.

With regard to the limitation of treatment by arsenic I have a few words to say. We seem to have a kind of natural dread of this drug. Its very name seems to convey the idea of poison, and thus its use has been mostly limited to moderate doses given for as short a time as possible. I do not share in this feeling; I think it can be given in large doses and needs sometimes to be given in these large doses to get its full effects. Take the case of chorea; its treatment by small doses is of little avail, but given in fifteen-drop doses of Fowler to patients from 10 or 12 years old upward the effect is truly marvellous. I receive letters from timid practitioners asking if I really mean to recommend this, and I assure them that a patient treated by fifteen drops of Fowler thrice a day after meals is usually quite safe FOR ONE WEEK, and this generally cures the patient. The medical journals have not accepted this view except with great caution, and some of them quote cases of paralysis, &c., but in these cases I observe the remedy has invariably been pushed beyond the limit of *one* week.

Next as to the continued use of arsenic in diabetes. It is astonishing to see how long it can be continued without doing

the patient harm. I can produce a patient who has taken five to ten drops of the liq. arsen. hydrochlor. once a day almost continuously for ten years. When he leaves it off his sugar begins to return, but it always disappears when he resumes his arsenic, and as long as he takes it he is in splendid health and free from sugar.

LARGE DOSES.

With regard to large doses. The effect of very large doses of calomel in acute furious mania is very decided and successful, but we should not limit the dose to 10 or even 20 grains. Thirty grains in a powerful, robust subject is quite safe, even if it has to be forced down while the patient is under chloroform. It soon nauseates the patient and renders him limp and amenable. Thoroughly occupied by his internal sensations, he comes through its action in a very different frame of mind and needs but little further restraint.

HOT SHOWER BATHS.

I must now ask your attention to a subject which is more germane to the objects of your Association. I refer to the hot shower bath in the treatment of insomnia, at the climacteric period, and as an emmenagogue in amenorrhœa and scanty menstruation. Apart from the drug treatment of insomnia and a general hygienic *régime*, we have here a simple and very effective hypnotic, but it ought to be used in the following way to get its full effects. Its temperature should not be less than 103°. It should be given last thing at night, or during the night if the patient is sleepless. The bath should be located in an adjoining dressing-room. The water-fall should not be less than two feet, and the patient should get into a warm bed. Then follows the drowsy approach of a calm, quiet sleep from which there is no awakening in a state of depression with headache, weakness and other horrors.

Next we find this hot shower of great use in dispersing the precordial oppression, the faintness and the flushing of the climacteric. More than this, it calms the agitated mind

and depressed spirits of these patients, and tides them over into a haven of rest.

Lastly, let me urge the importance of the hot shower as an emmenagogue. There are cases where scanty menstruation seems to depend on too much muscular and vascular tone. The fibres of these patients need to be relaxed. I think the hot shower does this, first by its effect on cutaneous circulation, and secondly by its appeal to the vasomotor system. For years I have used this remedy with great satisfaction ; I generally send the patient to the seaside, as I think hot salt-water shower baths are more effective, but I must mention that as an emmenagogue the bath should be taken during the forenoon and followed by a brisk walk. The great difficulty is to find *this hot shower* in many health resorts. There are plenty of spray baths, needle baths, and douches, but the old-fashioned hot shower is not there.

AVIEMORE AND ROTHBURY.

Now, Gentlemen, let me refer briefly to one or two climates of which I have had practical experience. The first is that piece of country lying north of Aviemore and Kingussie, running north to the Moray Firth, and extending from the valley of the Spey to the valley of the Findhorn. To my mind, you find here an ideal climate from June well into the autumn. The soil glitters with the sparkling detritus of the Cairngorm, Grampian and Monadhliadh mountains. It drains off rain as fast as it falls. It is not too hot, being tempered by breezes from the Moray Firth ; and its fine gravel radiates heat and reflects light so as to give a warm, bracing and sunny air, which has a most inspiring effect both on mind and body. It is free from the depressing effects of the Gulf Stream air which spoils the climate of the west and north coasts of Scotland during the holiday and shooting season, and it is sheltered from the bitter blasts of the north-east coast.

Only one place has to my mind the same qualities on a smaller scale, and that is Rothbury in Northumberland, which lies in the Coquet Valley, sheltered from the north-east and

surrounded to the west by spurs of the Cheviots, which have shed their granite and millstone grit over that lovely region.

I now conclude my most imperfect observations by thanking you for your patience in listening to them, and trust that I have not too widely strayed from the title of my address. I am painfully aware that I have but touched the fringe of this great subject, having devoted myself chiefly to the duration of treatment, as in the case of tertiary syphilis; and largeness of dose, as in the treatment of chorea by fifteen drops of Fowler. I trust I have not evoked scepticism or censure by advocating these decided measures. The facts speak for themselves. I have no doubt some equally striking results could be given by the advocates of very small doses in suitable cases, such as the one drop of *vin. ipecac.* every fifteen minutes in persistent vomiting, or the increase of nutrition brought about, especially in children, by calomel in doses of one-twentieth or one-thirtieth of a grain. Truly the treatment of disease and disorder is a many-sided affair, and the goal can often be reached by means which are diametrically opposite. Thus we need a wide outlook and very open minds in judging the many fads of the day.

VOTE OF THANKS FOR DR. MURRAY'S PAPER.

Dr. SYMES THOMPSON said he was particularly sorry not to see his old friend, Dr. Murray, but his fresh words in the paper brought him again to mind. Dr. Murray's habit of vigorous, independent action in the treatment of disease had been one of his characteristics ever since his student days. He would recall to memory a case in which that gentleman gained great credit thirty years ago. He had to deal with a case of abdominal aneurysm, which seemed, from many symptoms, to be on the point of bursting. Dr. Murray endeavoured, and with success, to put pressure on the abdominal aorta immediately above the pulsating aneurysm; but the pain caused by the pressure was so acute that he was obliged to desist. His (Dr. Symes Thompson's) own feeling was that the pressure must be stopped, the pain was so great

that continuation of the pressure would cause great damage, and would seriously interfere with the splanchnic nerves. But Dr. Murray was not to be daunted. He put the patient under chloroform, and, failing with the tourniquet, he and his clinical assistants kept up pressure with the fingers for eighteen hours, without interruption, and the result was a triumphant success, for the aneurysm consolidated and the patient was cured. That would serve to illustrate the sagacity and force of character of Dr. Murray. In a little work which Dr. Murray had published on therapeutics some years ago, he referred to the efficacy of very large doses of belladonna in renal calculus ; he pushed the drug to what would generally be regarded a dangerous extreme, and with very remarkable success, for again and again he had secured the passage of renal calculi by that means, and, he believed, in hepatic calculi also. He had really risen to express the gratitude of the Society to Dr. Murray for his paper, in which there were many points deserving careful attention. It showed that the physician should not be bound by routine measures in the treatment of disease ; he should be prepared to estimate the power of drugs in the case before him, not necessarily limiting the use of those drugs to customary or ordinary doses. He (Dr. Symes Thompson) liked the plan of giving small doses at frequent intervals better than the heroic plan set out by Dr. Murray ; still, he had no doubt that by such means good could be done. The members of that Society thought a great deal of the climatic treatment of disease, and he could not help thinking that the northern climate, not only around Newcastle but in that delightful region of the Findhorn which Dr. Murray had described, had stimulated the author's activities and given confidence and independence to his thoughts. Thus the paper which had been read was an illustration of the influences of climate on the nervous system and on the professional practice of one of the members. He felt very much grieved that Dr. Murray was not present. He received a letter from that gentleman that morning saying he hoped to have come, but there were signs of phlebitis about the injury, so that it would be unsafe for him to leave his room. The

paper was scarcely one for discussion, and he moved a vote of thanks to Dr. Murray for sending it.

The CHAIRMAN supported Dr. Symes Thompson's expressions of gratitude to Dr. Murray for contributing the paper. It was extremely interesting to find that Dr. Murray, after a long career, had not felt he had done wrong in the treatment he had outlined. To give 30 grains of calomel in a dose and not regret it proved the vigour of the man. The treatment of chorea by arsenic, and of phthisis by means of hypophosphites, showed that Dr. Murray had worked out the subject for himself and had been satisfied about the value of the treatment in a long experience, and showed also that he had not been so sparing of drugs as were many physicians in these modern times.

The resolution of thanks was carried by acclamation, and the meeting terminated.



Original Communications.

THE HEALTH STATIONS IN THE SOUTH-WEST OF FRANCE.

BY LEONARD WILLIAMS, M.D., M.R.C.P.

*Physician to the French Hospital, London; Assistant-Physician to the
Metropolitan Hospital.*

FIVE years ago, after a voyage with the V.E.M., I published in the Journal some impressions of the Pyrenean health resorts. Another visit, just completed, under the same pleasant and instructive auspices, invites to further impressions and some comparisons.

Professor Landouzy, the leader of the party, who explains at each station its particular merits, is fond of saying that the English "invented" the South of France. There is no doubt a considerable amount of truth in this sly quip, especially when we consider the Riviera, Pau and Arcachon; but the remarkable thing is that having discovered the merits of so many places in this region, our countrymen should remain comparatively blind to the merits of the Pyrenees proper as a holiday district, and to the claims of its sulphur water stations as therapeutic resorts. For it is, in truth, very few of these stations which are really known to the profession in this country. Luchon, Cauterets and Eaux Bonnes are recognised perhaps, but they are certainly not appreciated; whereas, Bagnère de Bigorre, Barèges, St. Sauveur, Argeles and St. Christau are mere names to the vast majority. When we recall the fashion which obtained until quite recently—a fashion which our Society has done so much to discourage—of sending patients to Germanic health resorts merely because these health resorts had mastered the art of self-advertisement, it is not altogether surprising that the Pyrenean stations should have so long languished in the shades of unmerited neglect. Their time, however, is undoubtedly coming. Spa treatment, as Dr. Landouzy is fond of insisting, is not a matter merely of the chemical composition of the natural waters. A spa

is like a person, or a wine. It has its own individuality, its own personality, and you can no more gauge its therapeutic resources by estimating the number of grammes per mille of the salts contained in its waters, than you can gauge the intellectual power of a man by estimating the solids in his urine. The personality of a spa is made up of altitude, moisture, exposure, soil, and the various other subtle elements which go to form a climate, and as to its waters, we may as well confess openly that in the present state of our knowledge we are not able to affirm anything positive in connection with them, except perhaps, this, that demonstrable chemical composition has less to do with their therapeutic effects than radio-activity and some other forces, the exact nature of which are still hidden from us. We must, therefore, be content at present to form our opinion about mineral waters and mineral water stations by their clinical results. The laboratory will doubtless some day supply us with reasons for our faith. And if clinical experience is to be our guide, the day of the Pyrenean stations is certainly coming. From the point of view of climate alone they offer, in definite degrees, a variety of meteorological conditions which is not to be found elsewhere, and waters whose therapeutic value has been demonstrated over and over again, even in well-known historical instances.

The question naturally arises as to how it comes that such stations are comparatively neglected, and the answer is the same as that which we have so often urged upon the attention of those responsible for the conduct of our own health resorts, namely, that they do not move with the times. With all the wish in the world to say something in favour of, say, the Luchon of to-day, as compared to the Luchon of 1900, I find myself at a loss. The place has not deteriorated, it has the same exhilarating climate, the same healing springs, the same ample *établissement*, the same magnificent casino, the same exquisitely beautiful surroundings, and the same picturesque guides, but it has not improved. There is, for example, no really first-class hotel, and from the same standpoint of luxury and comfort, the interior of the *établissement*

leaves something to be desired. There is nothing of which one may legitimately complain, but there are some things which might be improved. This, the view of a candid friend, while true of Luchon, applies to some extent to all the Pyrenean Spas. Those which I have mentioned are all good, quite good, from the point of view of accommodation and general management, but they might be better. It was hoped that one of the good effects of the occasional visits of Dr. Landouzy's party of critics would be the stimulating of the local authorities to further efforts to merit a good opinion. So far as the stations in question are concerned this hope can scarcely be said to have been realised, and I have little to add to what I said about them five years ago. While still a young man, who had accomplished nothing, Henri Quatre requested D'Aubigny to write his life, to which his future biographer replied: "Sire, commencez a faire, je commencerai a écrire." That is how I felt in the presence of the majority of the Pyrenean Spas.

One of the ways, it seems to me, in which not only the Pyrenean stations but the mineral water resorts all over France might "commence," would be in learning a lesson from their competitors across the Rhine. In France, as with us, there is nothing to prevent an ordinary visitor to a spa from prescribing for himself large and repeated doses of mineral waters or from subjecting himself to baths, douches, electricity, to anything, in fact, which the station offers in the way of therapeutic resources, without any sort of professional sanction. This is a serious mistake; for not only are accidents liable to happen, but such an easy-going *régime* must seriously detract from the prestige of the therapeutic value of the waters. The public argue, rightly or wrongly, that if any one is allowed to use them, they cannot be very potent either for good or ill. Such resources as a health resort presents in the way of special treatment, ought, at the very least, to be under similar restrictions to those which safeguard the sale of drugs.

But this is a digression. In saying that the mineral water stations of the Pyrenees fail to move with the times, I must not be understood to mean either that there is any immediate

need for such movement, or that all the places visited by this year's V.E.M. are to be included in the criticism. Such places, for example, as Argèles and St. Christau, would be deprived of their most engaging characteristics if enterprise converted them from the quiet, peaceful, restful stations which they now are, into noisy, fashionable resorts. And to be just, Argèles is an excellent instance of a place which has moved. It has an excellent hotel ; much improved since I was last there, and it has recently erected a new and very well-furnished *établissement* for treatment by light, massage and physical processes. It is, in fact, an admirably situated, well-managed, peaceful little spa, to which neurasthenics may be recommended with confidence, and whose general conditions render it especially suitable for what is known as an after-cure.

Of places to which the above strictures are in no sense applicable, and there are several, the climatic stations of Pau and Arcachon stand pre-eminent. Pau is so well known for its mildness, its stillness, its magnificent view of the Pyrenean range, its golf course, and its historical associations, that it is needless for me to dwell upon its attractions. Of it, the learned and witty Professor's joke that it was "invented" by the English, is literally true. We discovered it, and perhaps helped to develop it, but the energy and the foresight of those in authority have perfected it. For perfect it is, from the sanitary, the hygienic, the prophylactic standpoint. In everything which pertains to the public health ; drainage, water supply, provision against epidemics, disposal of refuse and the like, it is fully abreast of the most exacting modern requirements, and in the possession of a most complete public bacteriological laboratory it is in advance of nearly every place of its size in the world. This laboratory was given to the town a few years ago by our distinguished *confrère*, Dr. Meunier, who, aided by an exceptionally wise and public-spirited mayor, has succeeded in placing the town in a sanitary state, which might well serve as a model to the nations round. I have so often had to complain of the sanitary state of Continental resorts, fair above, but foul below, that it is pleasant to be able to point to one against which malice itself

could find no word to say. Dr. Meunier's munificent gift of the laboratory to the town has had an unexpected consequence, namely, the establishment in connection therewith of one of the most complete meteorological observatories which it has been my fortune to encounter. It is Dr. Meunier's son who presides at the laboratory, and four years ago, in order to test Pau's claims to be classed high in the list of winter resorts, he began, not without trepidation, to take meteorological observations. Being something of an inventive genius, this gentleman has evolved instruments of observation and precision which are at present peculiar to Pau, but which from their ingenuity, convenience and accuracy, deserve to be widely known and utilised. The sunshine recorder, for example, is an ingenious advance upon the Jordan photographic recorder commonly in use here. There is a self-registering rain-gauge, and there is an instrument which records not only the hours during which rain falls, but also and separately, those during which the atmospheric humidity reaches saturation. The latter is an admirable device which would be invaluable if generally adopted, in that it would substitute definite figures for the vague general assurances which one is now forced to accept upon a most important climatic point. Pau, then, is not only the sanitary town *par excellence*, but it bids fair to become a sort of meteorological Mecca to which all those will repair who desire to study the latest advances in meteorological instruments. The place has good reason to be proud of Dr. Meunier and his ingenious son.

Another place which has, in a very conspicuous manner, moved with the times, is Arcachon. The merits of this station were originally discovered by Dr. Corrigan, an Irish physician, who "invented" the water-hammer pulse of aortic regurgitation, and the town has recorded its appreciation of his services to it by naming an avenue after him. Arcachon is *par excellence* the anti-tuberculous station, and it has vindicated its claim to such a title not only by clinical effects produced by a residence thereat, but also by the very admirable original work which the practising physicians, notably Dr.

Lalesque,¹ have contributed to the many vexed questions which surround the therapeutics of phthisis by marine climatic methods. Arcachon, as is well known, is not on the sea, but on a lagoon, and it consists in reality of two towns, the one on the shores of the lagoon, the *ville d'été*, and the other, the *ville d'hiver*, on the hill among the pine woods. It is, of course, at the latter that the tuberculous are treated. The sanatorium which has been established there is a model of situation, exposure and management, and the results there obtained show clearly enough that whether it be due to the marine climate, the pine forest, or the sandy soil, or to all or none of them, the management of the tuberculous and the pre-tuberculous is better understood at Arcachon than elsewhere. The well-deserved eminence to which this station has attained could not be better exemplified than by the fact that it was chosen as the seat of the Second Congress of Climatotherapy and Urban Hygiene, which was held in the spring of this year.

For the place is second to none—not even to Pau—in the perfection of its sanitary arrangements, and the care which is lavished on the public health. There is, in fact, no station, either at home or abroad, where the local authorities, at the instance and under the guidance of the local physicians, have done more to convert their town into a health resort worthy of the name. With its mild and equable marine climate, its sandy soil and its pine wood forest, Arcachon is immensely favoured by Nature; with a wisdom which is all too uncommon, however, she does not trade upon her natural advantages, but labours honestly and scientifically to continue to deserve and even to enhance the great reputation to which she has already attained. The amount of original work which comes from Arcachon, notably from the pen of Dr. Lalesque, is astonishing. It is to this station that we owe the new method of treating tuberculosis, and probably other conditions, which, though still very much in its infancy, is nevertheless full of hope and promise, namely, the subcutaneous injections of sea-water.

¹ "*La mer et les tuberculeux.*"

The V.E.M. have become so deservedly popular and are so much appreciated as a cheap, agreeable and highly instructive method of making personal acquaintance with the French health resorts that it has been decided, in future, to limit the number of those taking part. A few years ago this number barely reached 100. This year there were no less than 150. The difficulties connected with moving so large a body about inevitably resulted at one or two places in complaints of crowding, and of quarters which could scarcely be described as first-class. There can be no doubt of the justice of some of these complaints when viewed from the standpoint of the individual, and the authorities have wisely determined to avoid them in future by declining to accept any further names after the figure of 100 has been reached. The organisation, therefore, now enters upon a new phase. Formerly, it was necessary in order to obtain adherents to advertise the advantages of the trips. Henceforth, participation must be regarded as a favour conferred. And this is altogether as it should be; for it is an inestimable advantage to any one in search of recreation combined with instruction to be able to travel with a party of French gentlemen, many of whom are very distinguished, and to have the merits of the particular stations explained by such a master of exposition and elocution as Professor Landouzy, at a cost which is ridiculously low, and with travelling facilities which are perfect. It is, I understand, intended to reserve a certain number of places for each nationality, but particulars for next year are not yet forthcoming. When they are I will endeavour to make them known so as to give plenty of time for intending applicants to secure places.

A NOTE ON FLAMSTEAD AS A HEALTH RESORT FOR CHILDREN.

BY S. D. CLIPPINGDALE, M.D., F.R.C.S.

THERE is a tradition that in the reign of Henry VIII. London children were sent, for the benefit of their health, to Flamstead in Hertfordshire.

The present Vicar, the Rev. I. V. Ballard, who has investigated this subject, has proved from his researches in the Record Office the accuracy of the statement in Lewis's "Topographical Dictionary," that Henry VIII. did actually send "his most dearest son" (afterwards Edward VI.) to Flamstead with the hope that the salubrity of the air would be beneficial to him. The change of air, however, does not seem to have produced any permanent benefit in his delicate constitution, for on his return to London the young prince, then in his fifteenth year, writes in his diary, under April 2, 1552, as follows :—

"I fell sike of the mesels and small pokkes."

He seems never to have recovered from the weakness produced by this illness, for he died within a year following ; his death being hastened, it is supposed, by a variety of quack nostrums (some say poisons) acting on a delicate frame.

Fashion operated in those days as in these, and Mr. Ballard shows that sick children continued to be sent from London to Flamstead during the reign of Elizabeth, though the parish register shows that they did not all recover.

Flamstead lies at a distance of twenty-five miles from London on the Midland Railway, three miles from the station at Redbourne. The soil is clay overlying chalk, and the village is perched on an eminence 500 feet above sea-level, overlooking the little river Ver. There is no arterial drainage, earth closets being used, and the water is pumped by an engine from a well going down to the chalk. The inhabitants, some 1,700 in number, are mostly engaged in the straw-plaiting trades of the neighbouring towns of Luton and Dunstable, and herein lies the danger of the introduction of

infectious diseases. Until recently, however, scarlet fever was not known in the village, or, as the Vicar puts it, "seemed to dislike the place."

The Medical Officer of Health to the district (Dr. H. N. Edwards) writes : "There can be no doubt as to Flamstead being an exceedingly healthy place for children. Those coming from other places to reside at Flamstead almost invariably improve in health, except, perhaps, those addicted to asthma. Tuberculous children do very well. I understand the late Sir William Gull knew the place and sent patients here, saying there was no healthier place so near London."

It may be useful, therefore, to remember, that within a reasonable distance from London there is a place, the salubrity of which received royal recognition three hundred years ago, and would probably, at the present time, be a suitable site for a sanatorium for the consumptive or otherwise sick children of the Metropolis.

MARINE THERAPEUTICS.¹

BY DR. ROBERT SIMON (PARIS).

THE SECOND CONGRESS OF CLIMATOTHERAPY AND
MARINE THERAPEUTICS.

THE Second French Congress of Climatotherapy, which recently held a meeting at Arcachon, under the general and local presidency of Professor Renaut, of Lyons, and Dr. Lalesque, of Arcachon, was particularly interesting, owing to certain questions discussed there. Founded by Professor Huchard and held for the first time at Nice, to be followed by meetings at Cannes, Monaco, Ajaccio, Biarritz, Saint-Trojan, &c., the Congress of Climatotherapy proposes to make a special study of the therapeutic effects resulting from a stay at the seaside. These questions have been the object of several international congresses held successively at Boulogne-sur-mer, Ostend and Biarritz. A movement is in progress in favour of marine cures which the many medical virtues of the sea, and the important part it takes in therapeutics, fully justifies. Having studied the scientific value of seaside treatment, I propose in this article to indicate briefly the lines along which modern thought and practice seem to be moving.

Quinton's researches² showing the sea origin of the first visible living cell on the globe, and the persistence throughout the animal kingdom of vital surroundings for the cells, which is none other than the sea itself, enables us to seize upon the mechanism of the marine cure—a cure practically as old as the world itself—and to state its action precisely. These researches have also brought a new fact before our notice,

¹ Translated from *La Revue des Idées* (Studies in General Criticism appearing in Paris the 15th of every month). Extract from No. 18 (June 15, 1905).

² R. Quinton, "*L'eau de mer, milieu organique*," Paris: Masson. See also, *Ld Revue des Idées*, No. 3, March 15, 1904, p. 187.

F. Lalesque, "*La mer et les tuberculeux*," Paris: Masson, 1904.

namely, that marine action is peculiar to the sea itself, which is the original medium of all living creatures. Consequently this action may doubtless be obtained far from the coast, apart from all climatic influence, by simple transfusions of sea water under the integument, transfusions which in the marine aquarium which our cells and the fluid which bathes them may be considered to represent, has the same value as the addition of fresh bouillon to an exhausted culture tube.

I.—*Historical.*

The beneficial results produced on persons suffering from different affections by a sufficiently long stay at the sea has always been a well-recognised fact. Among the ancients, Hippocrates and Celsus recommend sea voyages as a preventive of consumption, and Cicero was relieved of frequent hæmoptysis by taking repeated sea voyages around Greece. It was further a fashion in Roman society to send sick persons to Egypt to recover their lost health.

But in these cures the climate of Egypt appeared less salutary than a long sea voyage. Pliny himself assures us of it: "*Neque enim Egyptum propter se petitur, sed propter longinquetatem navigandi.*" The value of marine therapeutics was thus even at this time a well-known and definitely accepted fact.

With the fall of Rome, this knowledge of the curative powers of the sea was ignored until the eighteenth century, when it was revived by some English doctors. F. Gilcrist, A. Sunderland and Buchan, relate a few cases of cure, and after them reports began to accumulate. At last, after sixty years of tentative efforts, success appears to be forthcoming.

The splendid results obtained by Berck in the treatment of scrofula have especially forwarded the movement, and sanatoria, both in France and elsewhere, are yearly becoming more numerous. Scrofula is not exclusively treated there, lymphatism, anæmia, and all diseases in general resulting from tardy nutrition obtain benefit from sea treatment. Finally, after much hesitation and many struggles, the marine cure for pulmonary tuberculosis is beginning to develop itself. In

spite of all the numerous differences of opinion which still exist among medical men, the authenticated results hitherto obtained are full of hope.

Thus the therapeutic power of the sea is impossible to deny. This does not constitute an isolated fact ; it is, on the contrary, united to another group of facts, all of which tend to establish the power of sea water as a vital agent.

First it will be noticed that man is not the only animal who profits by living at the sea, we know the special beauty of animals fed in meadows watered by the sea, by grazing in fields near the seashore, breathing air laden with sea salts ; these animals acquire that healthy look in skin and fur visible to the least observant eye. They resist epidemics with a vigour unknown to inland-fed animals, and finally their flesh acquires the particular flavour for which they are noted.¹

As well as the immediate effects derived by staying in a sea atmosphere, there are other marine actions, less apparent, but which nevertheless are closely connected with them. It is possible to compare the therapeutic results of the same class with certain waters, such as the chloride of sodium waters of Salien-Moutiers, l'Archambault, Nauheim, Soden, Creuznach, Salies-du-Béarn, Balaruc, Bourbonne, Bourbon, Neiderbronn, Wiesbaden, &c. Patients suffering from bony and cutaneous tuberculosis, rickets and arthritis, derive as much benefit from these waters as from the sea itself.² All these waters become mineralised in their passage through salt reefs of undoubted marine origin.³ They constitute real sea waters, and their action is essentially a marine action.

These sea salts in the mineral state give proof of most interesting therapeutic power. Chloride of sodium, which is the first element of sea salt, and often even ordinary kitchen salt, which contains besides chloride of sodium several other sea salts, have frequently been used with excellent results, in

¹ R. Quinton, "*L'eau de mer, milieu organique*," pp. 358-383.

² L. Braûche, "*Le chlorure de sodium et les eaux chloruées sodiques*," Paris : Baillière, pp. 220-240.

³ R. Quinton, "*L'eau de mer, milieu organique*," pp. 234-246.

cases of pulmonary tuberculosis, diabetes, scrofula, chlorosis and anæmia.¹ Besides, for many years a solution of chloride of sodium known as "normal saline" has been used for subcutaneous injections in a great number of cases.

Lastly, ordinary sea water, as injected by Quinton in different diseases, is now recognised as a most powerful aid in therapeutics.² Thus we have a quantity of facts, all of which combine to show that the sea is a vital agent of very exceptional importance, namely, the action of sea climate and chloride of sodium waters of marine origin, the action of sea salts either by stomachic or hypodermic routes, the action of sea water itself by subcutaneous injections.

II.—*Supposed Causes of Marine Action.*

The causes of the therapeutic power of the sea have been widely sought after. The most diverse and contrary explanations are forthcoming, without one argument being sufficiently convincing to overcome the others. The necessary data for the solution are wanting up to the present.

In the first place, what are the factors which compose the active agents of marine treatment? The most—perhaps the only—important characteristics of marine climate have been in turn selected: constancy of temperature, luminosity, maximum of barometric pressure, purity of atmospheric chemical characteristics of sea air, each, according to particular authors, occupies a foremost place.

The temperature of the shore³ is characterised by a great equability; the sea, owing to the great calorific capacity of the water, only becomes heated or chilled very gradually, far more slowly than the earth; consequently it acts like a thermic regulator, storing up heat in hot weather, and slowly releasing it when the temperature becomes lowered. The humidity of the air—greater than on land, adds to this primary action, by

¹ L. Brauche, "*Le chlorure de sodium et les eaux chloruées sodiques*," pp. 459-466.

² R. Quinton, "*L'eau de mer, milieu organique*," pp. 459-466.

³ F. Lalesque, "*La mer et les tuberculeux*," pp. 10-27 and 107-119.

preventing a loss of heat by radiation. The thermometric movement is particularly small on the coast. The variations which take place to such an extent between night and day on land during the year are greatly attenuated. Some people attribute one of the most active agents of marine cures to this constancy of temperature.

Now if it is certain that this equability of temperature is favourable to certain cases of pulmonary tuberculosis there is no doubt that Fonssagreve's opinion, upheld by an entire school, is greatly exaggerated, *e.g.*, "That the formula of a climate for consumptives is more or less comprised in these two words—thermic stability."¹ In any case, it is difficult to understand how this constancy of temperature could play an equally important part in all diseases cured by sea treatment. Now what we must seek is not a factor acting in a few particular cases, but a single cause, which shows itself under such widely differing circumstances.

Although temperature plays a certain part it should not be considered as an essential factor. Barometric pressure² augments in proportion as altitude becomes less; it is therefore at the sea that it attains its maximum. Some specialists regard this fact as most important, respiration, they say, being greatly facilitated by the density of the air, each inspiration causing a large quantity of oxygen to pass through the lungs; the respiratory movements thus become slower without inconvenience, which produces a calming influence. Circulation is aided in the same manner. The importance of barometric pressure may hold good in theory, but it is unfortunately condemned by facts, for if this is its influence, patients should avoid mountainous places at all costs. Now, mountain treatment, for reasons unknown at present, is always found to be the most beneficial, especially in those stations with chloride of sodium waters, situated at a very high altitude, where marine results have been obtained. If, therefore, barometric pressure plays any part in marine cures, that part

¹ F. Lalesque, "*La mer et les tuberculeux*," pp. 10-27 and 107-119.

² F. Lalesque, *ibid.*, pp. 81-85 and 118-119.

is an insignificant one. The same applies to the hygrometric state,¹ the importance of which has not been exaggerated. It seems highly probable that the damp atmosphere at the sea coast have a calming influence, though this does not apply to the Mediterranean, where the air is rather dry. Light is particularly bright on the coast ; the sea absorbs the caloric rays, but reflects the chemical light rays. Dr. Barbier, at a recent Congress held at Arcachon, dwelt strongly on the importance of this fact.² This particular luminosity acts on bacteria, which it destroys ; it is, therefore, useful as an anti-septic agent. On the other hand, it has a stimulating, though somewhat undecided, effect on the organism, which appears necessary to its normal vital action, but which may become dangerous if it is too strong.

A factor which would seem to be more important is purity of atmosphere.³ The air of the open sea is almost, if not completely, aseptic. On approaching land the bacteria increase by degrees. Miguel discovered from 6 to 45 per cubic metre of air at 100 kil. from the shore. Even on the coast the number of them is considerable.

According to Lalesque and Rivière there are from 100 to 110 per cubic metre in the lagoon at Arcachon, but what is this compared to the average result obtained by Miguel in the Rue de Rivoli in Paris ?

Thus we may say that, on the whole, the air on the coast as on the mountains, is very pure, and it is impossible to deny that this is of the greatest importance. This is further emphasised by the fact that, whatever be the curative power of the sea, it is no protection against pulmonary tuberculosis among sailors, who are exposed to the dangers of contagion, owing to their unsatisfactory lives on shore, and the polluted air of the between decks.

Nevertheless, important as it is, this purity of atmosphere

¹ F. Lalesque, "*La mer et les tuberculeux*," pp. 40-50 and 109-113.

² H. Barbier, "*Les sanatoriums maritimes de la côte Atlantique en France*," Paris, 1905, pp. 15-16.

³ F. Lalesque, "*La mer et les tuberculeux*," pp. 100-106.

does not explain all the effects of sea climate, nor does it throw any light on the action of the thermal chloride of sodium waters.

III.—*Probable Causes—Quinton's Theory.*

The presence in the air of salts dissolved in the sea constitutes the most essential quality of sea climate; it is in itself quite characteristic. The presence of these salts, as well as their therapeutic action, has been greatly discussed.¹ It is a popular and generally accepted belief, that when at the sea-side, salt, deposited by the breeze, may be tasted on the lips. The existence of these salts has been denied by those who lay stress upon the fact that the evaporation of sea water only draws up watery vapour, leaving the salt in the sea. This is undoubtedly true, but the existence of salts in the air can be explained by reference to mechanics.

The wind blows drops of water off the crests of the waves, which it pulverises and carries away with it. The result is that the proportion of sea water held in suspension in the air varies essentially with the violence of wind and waves. In very calm weather, or with a land breeze, such small quantities of it are found that its presence could only be demonstrated by the most minute chemical analysis. When, on the contrary, the wind is strong, enormous quantities of these salts may be carried away. Peligot relates the following: ² Mr. E. Marchand, from Fécamp, has described the effect produced by a north-east wind which sprayed particles of sea water on to leaves, which, under this influence completely perished. . . . In certain cases the influence of the sea winds causes vegetables to wither under a chrystalline envelope which covers them, and which, according to M. Mole, is sometimes so thick that the officers of the Public Treasury are obliged to intervene to prevent the inhabitants from taking and consuming this salt, for which no tax has

¹ F. Lalesque, "*La mer et les tuberculeux*," pp. 86-93 and 133-143.

² R. Quinton, "*L'eau de mer, milieu organique*."

been paid. Lalesque relates a similar fact :¹ Saline particles were carried by a storm as far as the vineyards of la Gironde, to such an extent that the grapes tasted absolutely salt.

Between these two extremes and under ordinary atmospheric conditions the wind holds very small quantities of water in suspension, but which, however, are quite appreciable. Armand Gautier² measured the chlorides contained in 341 litres of sea air, kept in by a pad, at the lighthouse of Rochedovere at 50 or 60 kil. from the coast. In the litre of air he found 22 miligrammes of chloride expressed in chloride of sodium. Duphil's analyses produce similar results.

Thus the marine atmosphere holds variable proportions of sea water in suspension, which continually impregnate the organism. Sea baths only add to it, and food procured there may do likewise, for animals and vegetables raised there become impregnated with a far greater proportion of sea salt than those raised inland.³ Now what is the influence of this new factor in marine treatment? Many authors consider it the one and only therapeutic influence of the sea. Others, on the contrary, regard it as a dangerous element. A third group, however, believe it to have no effect whatever, or at any rate a negligible one. Here, again, we find only uncertainty and contradiction among authors. No one appears to advance a solid argument.

Quinton's recent works have, on the contrary, provided us with data which throw a new light on the subject. Quinton has, in fact, established the precise value of sea water as an organic medium. After having shown us the marine origin of life, he goes on to prove that the liquids throughout the animal kingdom in which an animal's constituent cells are bathed (blood lymph and all the organic plasmas in general) originate from sea water. Thus we gain a new idea of the organism, which appears to be "a veritable sea aquarium where the cells which form it continue to exist under their

¹ F. Lalesque, "*La mer et les tuberculeux*," p. 89.

² Armand Gautier (1899), *C. R.*, 128, 715, 716.

³ R. Quinton, "*L'eau de mer, milieu organique*," pp. 406, 408.

original aquatic conditions.”¹ Part of the experiments which support this theory have already been cited in a previous issue.² There we saw how a dog received large injections of sea water without any serious inconvenience ; how another dog, previously bled and apparently dead, was brought back to life in a few moments by injections of sea water, and which after a few days exhibited a superabundance of spirits and a greater hæmoglobin value than before the bleeding ; finally, how leucocytes which were believed not to be able to sustain life in any but organic surroundings flourish in sea water. These facts convey to us some idea of the therapeutic action of sea water ; it produces healthy organisms and furnishes vital surroundings for patients whose plasmas are polluted by poisonous microbes or by non-elimination of the waste products³ of the body producing auto-intoxication. Now this is an important point ; we know the susceptibility of the cells to the least chemical change in the surroundings in which they exist. Raulin, by growing some *Aspergillus niger* in artificial liquids, has demonstrated that if the chemical composition of some culture broth was slightly modified, the vital powers would immediately become depressed. Thus Raulin’s liquid consists for 1500 gr. of water 0.04 gr. of oxide of zinc, that is, only 0.032 gr. of zinc. Now if this zinc were omitted the crop of aspergillus would fall from 25 gr. to 2.5 gr. The action of this small quantity of zinc is enough to produce a plus value of 22.5 gr., that is to say, the weight of a plant 700 times heavier than its own weight. In a few experiments the number has been known to rise to 933.⁴ The omission of zinc is not the peculiar cause of depression of vital power ; the disappearance of any of the

¹ R. Quinton, “*L’eau de mer, milieu organique*,” p. 425.

² *La Revue des Idées*, March 15, 1904, No. 3.

³ It should be added that in cases of acute poisoning sea water has proved to be a powerful agent of disintoxication ; that in cases of chronic intoxication it is a powerful aid to the suppression of the poison and to the recovery of the organism. In consideration of this it should rank as a valuable agent in the treatment of suppression and during the convalescence of morphia maniacs, cocaine maniacs, &c.

⁴ Duclaux, “*Traité de microbiologie*,” Paris : Masson, 1898, p. 180.

constituent elements of Raulin's liquid would produce quite the same result.

The slightest variations of the culture broth seriously affect the lives of the creatures which live in it, and what applies to the constituent cells of an animal applies also to those of a plant. No matter how slight a change were to disturb the composition of the blood—the culture broth of the cells—the whole organism would suffer in consequence, so that by reducing the vital vitiated surroundings to their normal state the diseased organism is brought back to a healthy condition. In order that we may prove by experiment the effect which the absorption of sea water has upon the patient, and if we wish to release it from the influence of the other factors which we have just examined, we must be able to vary or suppress these factors at will. Now we find these particular conditions in Nature herself, for we see on the one hand that the quantity of sea water held in suspension in the air varies with the wind, and that on the other various treatments, such as chloride of sodium waters and sea water injections, present a type of marine cure quite apart from any other factor than sea water itself.

Lalesque, at a Congress at Arcachon, stated that in spite of the bad effect the wind has on consumptives, it need not be feared. "Numbers of patients," he said, "undergoing seaside treatment feel better on windy days," that is to say, when the atmosphere is more heavily laden with drops of sea water. One patient writes :¹ "The calming effects are clearly shown in stormy weather when the sea is rough ; I never felt so well or so rested as when there was a north or north-east wind which caused the boat to toss on the choppy water of the lagoon. In calm and hot weather I did not feel the sensation of repose to the same degree." Thus a primary fact is evident ; more benefit is derived from sea air in rough weather.

In the second place, a clear parallel may be drawn between the results produced by sea air treatment and those obtained by other marine methods, namely, chloride of sodium, mineral waters, use of sea salts and sea water injections.

¹ F. Lalesque, "*La mer et les tuberculeux*," p. 199.

For example, the effects on scrofula and lymphatism obtained at the seaside resemble those produced by the waters of Salien-Moutier and Salies de Béarn, &c., but the parallel is particularly striking between the results of marine climate and sea water injections, as Quinton and other observers have demonstrated.

The first consequence of a stay at the seaside manifests itself in what is known as "marine fever." Without invariably occurring, these fevers, though transient, appear very frequently. Guinon states that¹ "At the beginning of a stay by the sea young patients are often subject to sleeplessness and fever during the night." Later the fever begins to abate, and in cases where, before his arrival, the patient was in a feverish condition, the temperature will fall by degrees and finally disappear.

Sea water injections produce similar results, only as their action is much quicker and more abrupt its effects are speedier and more pronounced, that is to say, in a few hours instead of several days. According to Quinton, "The injection is followed by a reaction which lasts about twelve hours. One, two, or three hours after, the patient is seized with shivering fits, often very violent, chattering teeth, and sometimes very great thirst. The temperature rises without ceasing during four or five hours (about 1.5° to 2°), then falls as it rose, generally below its former level.² The result in both cases is exactly the same. (We refer here to injections of 600 gr. to 800 gr., which Mathieu, Quinton and I have since discontinued in order to avoid excessive reaction; after doses of 100 gr. to 200 gr. the reaction is generally slight.)

The resemblance continues during the treatment. The return of appetite is the first sign of it. "I do not know," says Dujardin-Beaumetz,³ "a more powerful stimulant for the appetite, and particularly for the digestive organs, than sea air." We have seen that after sea water injections the patient, who

¹ L. Guinon, "*Les pré-tuberculeux en cure forestière et marine*," Paris, 1905, p. 6.

² R. Quinton, "*L'eau de mer, milieu organique*," p. 464.

³ F. Lalesque, "*La mer et les tuberculeux*," p. 253.

for many months previously had no appetite whatever, is able to take three or four meals a day, two of them consisting of bread, vegetables, two kinds of meat, fruit and puddings.

Sleep results from both treatments.

In pulmonary tuberculous cases the first results issued by Quinton distinctly resemble those observed at the seaside ; the return of appetite and sleep and the lessening of the cough and expectoration, are the same in both cases. These effects appear due to the same causes ; thus sea water would seem to be the essential factor in marine climatic treatment.

IV.—*Marine Treatment of Pulmonary Tuberculosis.*

It is not necessary to discuss here the results obtained by marine treatment, as they are universally acknowledged ; still, its development has not yet been fully considered. Facts are not lacking to proclaim its value ; the efforts of men like Lalesque, who brings a unique experience to the solution of the question, have made them well known to us. And yet doubt continues in medical circles owing to the controversy which has raged round a misinterpretation of facts.

During the first half of the nineteenth century the advantages of marine treatment appeared incontestable. "I am convinced," said Laënnec,¹ "that in actual science we have no better means with which to combat consumption than sea voyages and residence at the seaside in a mild climate, and I strongly advise them whenever possible." But quite an unexpected view now presents itself ; in 1856 a French naval doctor named Rochard published a statistical work in which he showed that consumption is quite as common on men-o'-war as on land. He emphasises this fact in order to deny the beneficial influence of the sea. "Consumption," he writes, "far from being rare among sailors is far commoner than in the army. It rages among our squadrons in the hospitals of our ports. Naval officers, doctors, stewards, all those, in fact, who voyage by sea run the same risk."²

¹ F. Lalesque, "*La mer et les tuberculeux*," p. 253.

² F. Lalesque, *ibid.*, p. 152.

Rochard's work caused considerable interest, and an entire school followed him in proclaiming the maleficent influence of the sea. This theory was for a long time the subject of controversy without any satisfactory results.

This uncertainty continued until Koch's discovery of a bacillus presented the possibility of contagion; from that time Rochard's theory was abandoned. Rochard based his statistics on the ships' crews. Now in these surroundings the overcrowding of sailors in the between-decks is certain to produce contagion. The lack of light and ventilation cause the ships to become a hot-bed of infection, which the sailors, owing to their laborious lives and the absence of hygienic conditions, find almost impossible to resist. It was owing to this state of things, and not to the marine atmosphere, that tuberculosis raged so violently in surroundings which Rochard chose as an example. If statistics were gathered from populations living on the coast who pass their days on the sea, though not under the conditions found on a large vessel, it would be seen that tuberculosis is comparatively rare. But the results obtained nearly every day from tuberculous patients undergoing marine treatment constitute the best reply to Rochard's theories. They are most characteristic at Hendaye, and especially at Arcachon. Barbier, in his report of the Congress held at Arcachon, states in these terms:¹ "The Sanatorium at Hendaye for tuberculous children has now reached about 1,000 cases, among which there are 100 cases of tuberculous patients, 20 nurses, and 5 or 6 house surgeons, every one the subject of this disease."

This shows that children, especially those betraying symptoms of thoracic tuberculosis, may be sent to this sanatorium with every chance of recovery. Perhaps these patients would require some modification in the therapeutic formula which suits scrofulous subjects so well. For example, the patient may spend less time on the beach, and rest instead on an invalid chair; he may indulge in systematic exercises and

¹ F. Lalesque, "*La mer et les tuberculeux*," p. 154.

H. Barbier, "*Les sanatoriums maritimes de la côte Atlantique en France*," pp. 43-44.

breathing exercises, he may take a little raw meat or a little extra nitrogenised food—not with the view of fattening the patient, but in order to strengthen the muscles. However it may be, the results are as follows :—

(a) *Tuberculosis* (phase of germination or conglomeration, with or without bronchial adenopathy).—No fever or fatigue; return of appetite, colour and vigour; increase of thoracic perimeter; attenuation of physical signs. At the end of six months the details of the cure are as follows: all children who are not bedridden are bathed, and no rise of temperature is noticed after the bath. Again, the patients never catch cold: “No one ever coughs at Hendaye,” said Dr. Camino. They do not spend days in the infirmary, which is generally filled with patients suffering from scrofula and rickets.

(b) *Tuberculosis* (characterised by expectoration).—The rule limiting a stay of six months at Hendaye Sanatorium is unfortunate in this case. It is impossible to cure tuberculosis in so short a time. Nevertheless, at the end of the six months the patient departs much better, and it is to be hoped that if the treatment had been continued during a longer period the cure would have been complete.

Better results are obtained at Arcachon. Dr. Lalesque, whose devotion has done so much for marine cures, gives us a complete analysis of them, which prevents any doubt on the subject. After a long and continuous experience the marine cure at Arcachon has at length fixed on a technique which may be divided into three different types :—¹

(1) *The Forest Cure*.—The patient lives continually in the pine forests bordering the shore.

(2) *The Mixed Cure*, during which the patient lives in the forest, but comes daily to the beach, weather permitting.

(3) *The Marine Cure*.—Properly so called where the patient inhabits a villa situated on the shore of the lagoon itself. He may during the day remain on the beach, but he soon becomes better and begins the boat cure. Little flat-bottomed boats without masts are used, which can be anchored at some

¹ L. Guinon, “*Les pré-tuberculeux en cure forestière et marine*,” pp. 34-36.

distance from the shore or rowed about. The patient lies there on an invalid chair. Later he may be able to go out in an ordinary little fishing smack; then neither storm nor wind can stop his progress; as we have already said, that is more beneficial to him than calm weather.

These three kinds of cure may be combined or otherwise, according to the patient. A few years ago pulmonary tuberculous patients underwent the forest cure only. It was then considered that the marine cure would have immediately and rapidly aggravated the condition of any patient sufficiently imprudent to venture on it. By degrees trials were made of the sea cure, in small doses at first and increasing later. As only good resulted, and there seemed to be no reason for fear, it became part of the usual formula, which includes all three kinds of cure as soon as the state of the patient permits them passing successfully from the forest cure to the mixed cure, and from that to the sea cure.

However, this formula does not appear to be final, it seems that with care much may be gained by having recourse to the sea to a greater degree. Lalesque has already dared to try the marine cure on many of his patients at the first onset without any preparation. Of course these trials, which fortunately were quite successful, were greatly criticised. The result, as might be expected, was not only good in cases where the appetite was failing, for fat and pale lymphatics, and for bronchorrheics, but even for congestive and feverish patients, and those suffering from insomnia, to whom the advantage of a stay at the seaside is often denied. Lalesque has published¹ some observations on the curves in temperatures of feverish patients taken immediately on their arrival. Instead of becoming worse the fever rapidly becomes less and soon disappears. Often the temperature rises less than usual on days when the patient has been on the sea. The same applies to sleep, which is nearly always aided by the marine cure.

Thus the patients' fever, sleep, appetite, cough, breathing, all become better, and from this we may assume that a com-

¹ Lalesque, "*La mer et les tuberculeux*," pp. 210-223.

plete marine cure, far from being harmful, renders the greatest service.

V.—*Climatic Contraindications.*

In spite of all these perfectly established facts which can leave no doubt of the possibility of curing pulmonary tuberculosis by seaside treatment, its opponents have not yet given in. In fact, the struggle has adopted another attitude. Rochard's doctrines are no longer believed in, but many doctors, and even doctors residing on the coast whose experience cannot be gainsaid, absolutely refuse to receive pulmonary tuberculous patients in the localities in which they practise. Whence come these conflicting opinions? It appears even now probable that all maritime stations are not equally suited in their treatment of consumption; it would even seem that some are harmful. These facts are easily understood and in no way injure the theory we have been advancing. It has been shown how a great number of factors go to make up a marine climate; one element is above all clearly favourable, the nature of sea air, which by its purity and especially by the drops of sea water held in suspension, render it eminently beneficial. As regards the other factors, it is hardly known in what manner they act, nor to what degree they prove useful or harmful. In any case, as these climatic factors are essential, it is easy to understand that with the characteristics peculiar to each place, some may aid the beneficial effect of sea water, while others, on the contrary, may not only counteract the effect of the sea water, but may even more than nullify it. And if this action may even overcome that of the sea itself it explains why certain stations are bad for the treatment of pulmonary tuberculosis. Thus two neighbouring localities, like Hendaye and Biarritz, produce such different results that the doctors of the one place welcome consumptives, whilst those at the other decline them at any cost. It seems at the present time that the advantages for the cure of pulmonary tuberculosis are unequally distributed, and that some of the stations should even be discarded. However, it should not be taken as a fact that all

the seaside places which refuse to receive consumptives are really harmful to them. It must be remembered that only a few years ago tuberculous patients were not admitted at Arcachon; and yet it is now fully recognised that this station is marvellously organised for combating this disease. A movement with the object of forwarding this is now being carried out. Where will it stop? Perhaps as soon as we have learnt the peculiarities of each climate and how to avoid them, we shall be surprised to see the marine cure of consumption undertaken by degrees by many sanatoria which are now opposed to it.

VI.—*Resolutions of the Congress at Arcachon.*

A few medical men without fully understanding marine treatment, set themselves up in opposition thereto, and at the Congress at Arcachon tried to discredit it. The fight arose during the discussion of M. Barbier's report. The question was: "Should children suffering from pulmonary tuberculosis be sent to marine sanatoria?" The opponents of the cure were obliged to agree with the principle of it and to acknowledge the good results of Arcachon and Hendaye; but although no longer upholding the danger of marine treatment in itself, they raised the objection of contagion, on the grounds that scrofulous children might suffer from the proximity of pulmonary tuberculous children. They contended that consumptives should only be admitted into sanatoria specially provided for them. Realising that this proposition would cause an indefinite postponement of the whole question, as there are no sanatoria available, the Congress at that sitting would have nothing to do with the subject.

It passed a resolution that from that time all children suffering from pulmonary tuberculosis should be admitted to sanatoria now in use. It is likewise quite possible to admit them into the same hospital as scrofulous patients; the experiment has been made and succeeded perfectly. By taking precautions and by reserving certain portions of the sanatoria for consumptives, excellent results have been obtained, without one case of infection. Now in French sanatoria, owing

to a faulty organisation, thousands of beds are left unoccupied during the year. Shall we ever see these sanatoria open their doors to the little tuberculous children, and thus prove a means of restoring them to health? It remains to overcome the many stumbling blocks which any new work must inevitably encounter. What can the mere wishes of a congress effect against such forces? Without doubt the directors of sanatoria will continue to resist for a long time. We must hope that the public powers will interest themselves in a work of such general importance. Another resolution of the Congress deserves attention, it implores most earnestly that new sanatoria should be constructed. The number of available beds is cited precisely at :—¹

On the North Sea	...	...	...	...	440 beds.
„ Channel	...	...	...	...	1,800 „
„ Atlantic...	...	...	...	...	1,420 „
„ Mediterranean...	...	...	...	...	1,290 „
					<hr/>
					4,950 „

As it is necessary to calculate at least one year's stay for each patient, this number is quite insufficient. Berck, and especially Hendaye, which admit the children of Paris into their sanatoria, find themselves quite unable to receive the number of applicants, or to keep them as long as necessary. They often return only slightly better; they are sent back still diseased to the unhealthy homes from whence they came, which are not long in undoing the salutary effects derived from the treatment. *Apropos* of this, let me state one of the resolutions unanimously adopted by the Congress, namely, that convalescent homes should be erected at the seaside or the country, where patients leaving the marine sanatoria may stay before returning to actual social life.

It is impossible to state too often that the marine sanatorium is the best means of triumphing over tuberculosis. What is required is not only to attempt to cure those affected by tuberculosis by sending them to the seaside, but above all, to look after those predisposed to tuberculosis, those children

¹ H. Barbier, "*Les sanatoriums maritimes de la côte Atlantique en France*," p. 46.

not yet diseased, but who, owing to their physical defects, are irremediably doomed. These the sea would render strong and healthy, ready to resist and conquer the scourge.

Professor Landouzy states :¹ " It is no exaggeration to say that in the case of this legion of children suffering from debility, rickets, lymphatics, those attacked by scrofula, the legion of degenerates, dystrophics, children of tuberculous subjects and drunkards, liable to all diseases and contagions, and for the hundreds who are threatened with tuberculosis, a prolonged stay at the seaside performs wonders, resolving ganglionic enlargements, conferring upon all the tissues increased powers of resistance, modifying the nutritive capacity in common with all functional activities of the organism. In a word, transforming sickly children into new beings, renewing constitutions, resetting temperaments."

VII.—*Inland Marine Therapeutics : (1) Tuberculosis; (2) Cases of Organic Waste from Different Causes.*

As I have already stated, the effects of marine treatment, up till now inexplicable and purely empirical, have, owing to Quinton's researches, just been revealed. The subject whose organism is vitally affected does not only derive benefit at the seaside from the air he breathes or the barometric and other conditions; what he does chiefly benefit from are the salts which he absorbs there, and which beneficially affect the vital centres which have become depressed in the important matter of their mineral constituents.

We now know² that a chemical analysis of organic liquors will reveal seventeen metals and metaloids finely divided in an infinitesimal state, the principal being boron, bromide, iodine, arsenic, copper, lead, zinc, silver, gold, strontium, cesium, rubidium. All these bodies are found in sea water in precisely the same proportions.

The organic cells derive the elements of their activity from

¹ F. Lalesque, "*La mer et les tuberculeux*," p. 264.

² Quinton, "*L'eau de mer milieu organique*," chapter vi.

sea water, as in the case of the *Aspergillus niger*, which increases itself tenfold as soon as it is placed in the culture broth proper to it. Further, we know that though Arcachon and Hendaye receive phthisical patients and benefit them, other stations, for unknown reasons, refuse to admit these cases; likewise that these two former stations do not possess a sufficient number of beds to enable them to keep their patients until they are cured. Now that we know its mode of action can we refuse the benefit of marine treatment to tuberculous subjects and to the long list of those who are predisposed? Less than ever, now that we know the chief active agent at the sea is *sea water itself*.

All tuberculous subjects who by reason of the nature and degree of their malady need mountain treatment free or in sanatoria, and those, still more numerous, whose means or occupation will not permit them to leave their homes, hereditary subjects, pre-tuberculous, feeble, convalescents, or anæmic subjects, should undergo the marine cure, which may be taken in its simplest form; they should likewise receive injections of sea water, diluted with an equal part of spring water and sterilised cold, for heat modifies the molecular state and kills the organic activity of sea water.

In the same way that sea water injections are followed by immediate results resembling on all points the symptoms observed during the first few days at the seaside, so the curative effects, apart from the treatment by injections, appear to reach, and sometimes exceed, in rapidity and intensity those obtained by staying at the sea or on the mountains.

Without going into details which would only be of interest to the few, I give a table of results obtained from eighteen tuberculous subjects suffering from pulmonary lesions or more or less advanced pulmonary and glandular lesions, though sometimes very advanced, for we never picked our cases.¹

Nearly all these patients lost weight; in the case of three (two glandular cases and one pulmonary, the latter at the last

¹ See Robert Simon and René Quinton, *Académie de Médecine*, June 6, 1905.

stage) it was impossible to prevent this loss, which continued even after the injections were stopped. In the case of the fifteen others the results are divided as follows :—

No.	Stage	Weight before treatment	Weight after treatment	Length of treatment	Total gain	Gain per day	Improvement of physical signs
1	1st stage	59'500 kg.	60'200 kg.	37 days	'700 kg.	18'40 gr.	Very marked.
2	" "	47'900 "	49'600 "	54 "	1'700 "	33'72 "	" "
3	" "	55'700 "	55'800 "	44 "	'100 "	2'27 "	Marked.
4	" "	15 "	16'500 "	28 "	1'500 "	53'57 "	Very marked.
5	" "	55'400 "	56'200 "	25 "	'800 "	32 "	Marked.
6	1st stage of glandular tuberculosis	44'500 "	47'200 "	102 "	2'700 "	26'46 "	"
7	1st stage	60'700 "	63'500 "	47 "	1'800 "	38'59 "	"
1st stage.—Average of daily increase, 27'59 gr.							
8	2nd stage	55 kg.	56'500 kg.	44 days	1'500 kg.	34'09 gr.	Very marked.
9	" "	77 "	80 "	98 "	3 "	30'61 "	" "
10	" "	61'550 kg.	62 "	59 "	'450 "	7'62 "	Marked.
2nd stage.—Average of daily increase, 24'65 gr.							
11	3rd stage	69'200 kg.	74 kg.	110 days	4'800 kg.	43'63 gr.	Very marked.
12	" "	54'200 "	58'200 kg.	88 "	4 "	43'18 "	" "
13	" "	78'900 "	79 "	55 "	'100 "	1'80 "	Fairly "
3rd stage.—Average of daily increase, 35'17 gr.							
14	Lupus	61'500 kg.	61'500 kg.	68 days	'100 kg.	1'80 gr.	Marked.
15	Glandular tuberculosis	65'500 "	66'700 "	50 "	1'200 "	24 "	Very marked.
Average daily increase, 12 gr.							
Average daily increase for these 15 cases, 27'14 gr.							

It should be added that with most of these patients the incessant or frequent cough became less or disappeared, sleep returned, the appetite grew to such an extent as to be sometimes enormous, the weakly digestive organs became vigorous, which is sufficient to account for the increase of weight, the favourable progress of the lesions, and in a few cases the disappearance of all physical signs. In the case of a few patients the increase was little or none; that is because these were in a very advanced stage, and it may be supposed that the treatment has effected more here by stopping the loss, than elsewhere by increasing the weight.

This was the case with No. 10, second stage; this patient, weighed every week from August 10, 1904, to February 11, 1905, fell in weight from 78 kilogrammes to 61'550 kilogrammes thus losing the enormous amount of 90 grammes per day, and

was obliged to give up all active life. From the time of the commencement of the treatment the loss of weight stopped, and under the influence of a series of injections of 100 cc. every four days, a great improvement began to show itself, enabling the patient *almost at once* to recommence his laborious occupation. At the end of fifty-nine days he had gained 450 grammes. This does not appear much, but in reality it was enormous, considering that the sea water, by stopping a loss of 90 grammes per day, extending over a period of six months, benefited the organism in fifty-nine days to the extent of about 6 kilogrammes.

The gain likewise appears small in the Case of No 13, third stage, who had a vast cavity and incessant hæmorrhages, which always appeared as though each must be the last; he only gained 100 grammes in fifty-five days, but the hæmorrhage ceased, the expectoration became less, and the skin of a better colour.

With No. 3, first stage, 100 grammes in fifty days appears little in figures, but it is an admirable result verified by the ceasing and complete recession of all symptoms at the apex of the lungs, the disappearance of anæmia and of the premonitory dyspnœa, and the return to a thoroughly healthy appearance. It would seem that each organism makes use of the particular element in the sea water necessary to it, and that the action of the latter, though often different in each case, exercises its influence where it is most needed.

As a final example, take No. 9, a patient in the second stage. The gain was from 30·61 grammes per day. An entire lung was affected from the beginning; at the end of ninety-eight days of treatment the lesions had subsided in the proportion of 4 to 1, but above all it is now necessary to prepare twelve slides in order to obtain 9 bacilli, whereas before the treatment each such slide would contain 12 to 15.

I have already said that we chose eighteen tuberculous subjects indiscriminately. We had to abandon the treatment in the case of three. The fifteen others, some of them very gravely affected, showed signs of recovery to the extent I have just described.

Let us compare these improvements. They must be compared with those obtained at the best of our ocean stations—Arcachon—by him whose long experience of the sea and tuberculosis constitutes him the most fully qualified among us to give the *best* results. If our numbers taken in Paris be compared with those of Dr. Lalesque it will demonstrate their value.

Here are Lalesque's figures :—

	Total number of cases	Number of cases chosen and reported by Lalesque	Days of treatment	Average gain
1st stage	79	7	1,031	37·69 gr.
2nd „	49	11	1,474	39·18 „
3rd „	63	11	1,930	24·74 „
Total	191	29		

General average of daily gain 32·61 gr. relating to twenty-nine chosen as the best out of 191, but we must note that Lalesque, whose numbers I have just given, does not include his entire practice. These are twenty-nine of the best cases chosen from the many patients which make up his *clientèle* at Arcachon. These are well-to-do people, who have given up everything in order to follow the marine treatment at ease, by generous feeding and by benefiting from the climatic influences of the lagoon at Arcachon.

Our position is different, out of eighteen people fifteen got better, and we know that some of these were very seriously ill. They took their cure in Paris, in mid-winter, without giving up their occupations for a single day, continuing to live in the same surroundings where they had contracted the disease, and under the same social conditions. Our average daily increase of 27·14 gr. is very significant compared with Lalesque's average of 32·61 gr.

Lastly, I would point out that sea water takes effect in very different cases of organic waste, because whatever be the cause which has altered the vital surroundings, the sea water acts as a regenerator of the cells, and as a renovator of their organic medium.

Here are nine other cases where tuberculosis not being in the question the results are quite remarkable.

Case	Weight before treatment	Weight after treatment	Length of treatment	Gain	Daily gain	General remarks
Suspected adenopathy	52.200 kg.	55 kg.	66 days	2.800 kg.	42.50 gr.	Excellent.
Chronic paludism ...	55.100 "	57.700 "	15 "	2.690 "	173 "	Absolutely remarkable.
Cachexy after operation on cancer	52.700 "	54 "	21 "	1.300 "	62 "	Good.
Menorrhagia and dysmenorrhœa	47.200 "	50 "	41 "	2.800 "	68.30 "	Very good.
Salpingo-ovaritis and enteritis	52.700 "	54 "	12 "	1.300 "	108 "	Good.
Dyspepsia and enteritis	68.700 "	400	17 "	1.700 "	100 "	Fairly good.
Enteritis ...	64.500 "	...	18 "	2.400 "	133.30 "	Good.
" ...	54 "	...	24 "	...	...	Very good.
" ...	52.700 "	300	56 "	0.600 "	10.7 "	Good.

Here the average daily increase reaches 77.53 gr. In a category of thirteen invalids who had been sent to Arcachon for prophylactic purposes, and who may be compared to my second category, Lalesque has obtained a daily average of 39.60 gr. and those subject to hæmatosis, whom he ranks among pre-tuberculous, and confirmed tuberculous subjects of the first stage, showed a daily increase of about 33 grammes. In order to prove these estimates I refer my readers to the two works,¹ which contain the numbers by means of which I have calculated the averages on which I have based this comparison.

Conclusion.

In summing up these observations and comparisons we arrive at a final conclusion, namely, that the action of the marine cure is partly due to the salts dissolved in the sea. Sea water, which is the original medium and original centre of all living organisms, acts as a factor of regeneration and as a curative agent, minus all those elements which on shore would render its action obscure and unintelligible.

The fifteen examples of tuberculosis, and the nine examples of morbid states that I have just quoted, by virtue of this sea

¹ F. Lalesque, "*Cure marine de la tuberculose pulmonaire*," Paris, Masson, 1897, and "*La mer et les tuberculeux*."

action, may be regarded for this purpose *demonstrable facts*, and rank with Quinton's experiments, who, by the means of sea water injections, brought back to life dogs previously bled and apparently dead.

What will be the fate of marine therapeutics practised inland? It seems possible to predict a brilliant future.

Far from wishing to throw discredit on our Atlantic stations, I believe them destined to a growing prosperity. Undoubtedly the time is not far off when seaside doctors will not only allow their patients to benefit by the influence of climate and winds laden with marine salts, but will make use of the more rapid and certain action of sea water injections.

As regards other patients, those for example, who, owing to certain reasons are obliged to seek mountain stations, and for those who by force of circumstances cannot leave their homes—and these are the most numerous—the advancement of sea water injections (a kind of internal thalassotherapy), undoubtedly creates an epoch in the history of anti- and pre-tuberculous therapeutics. The credit of this is due to Quinton, whose scientific researches have shed light upon a theory hitherto unknown in the medical world.

AT THE SALPÊTRIÈRE.

A REMINISCENCE BY A MEDICAL STUDENT.

From the French of Alphonse Daudet.

CHARCOT'S room at the Salpêtrière, some ten or twelve years ago. An out-patients' morning. The walls are hung with photographs of *naïf* Spanish and Italian pictures representing saints. Saints in prayer, in ecstasy, in convulsion, in demoniac possession ; every manifestation, in short, of what is known here as *la grande névrose religieuse*. Seated at a little table is the professor, clean-shaven, with long, straight hair, a powerful forehead and a proud mouth ; piercing eyes are set in a pale puffy face. The house surgeon comes and goes. He wears a white apron and a velvet skull cap, and his keen eyes are almost invaded by an enormous beard. Seated round the room are several visitors, mostly medical men, Russians, Germans, Italians and Swedes.

The procession of out-patients begins.

First comes a woman from Var with her daughter, a hideous, undersized, ungainly little being. Her cheeks are covered with red cicatrices, while the green and yellow gaudiness of the South emphasises the aggressive shapelessness of her waist. The child is pregnant. A vessel spoilt in the making ; a vase cracked in the firing ! How could it be possible for her to become a mother ?

"During an epileptic seizure," Charcot says, while the old woman from Var, whining and sottish, tells the history of the girl's "indisposition." The professor turns to the house surgeon.

"Is there a fire in the next room ? Undress her there and see if she is marked."

The southern accent and the ugliness of the whole incident affect me. But I am even more touched by the next case. This is a child of 15 with a round, childish face, smartly dressed in a little toque and a maroon cloth jacket. She is

the image of her father, a petty shopkeeper in the Rue Oberkampf. He accompanies her.

Seated in the middle of the room, their eyes fixed timidly upon the ground, they reassure one another with furtive glances. The patient is questioned, and great is the distress. The idea of having to say everything quite loud, before such a lot of gentlemen ! They are asked to describe the seat of the pain, the way she falls, and the history of the first attack.

"When her grandmother died, M. le docteur," says the father.

"Did she see her dead ?"

"No, monsieur."

Charcot's voice softens when he speaks to the child :
 "You were very fond of your grandmother, eh ?"

She assents with a nod of the little toque, her throat swollen with sobs. The German doctor approaches her. He is interested in the aural affections in hysteria. He wears gold-rimmed spectacles, and placing a tuning-fork upon the child's forehead, says in a loud tone of command :—

"Rebeat after me—Sunday."

Silence. He is triumphant ; undoubtedly she has not heard. I rather believe that she has not understood. Follows a long dissertation by the German doctor ; the Italian joins in and the Russian interpolates a word or two, while the two victims, ill at ease and forgotten, sit where they are. Then the house surgeon, to whom I have confided my doubts, says quite gently to the little girl :—

"Repeat after me—Sunday."

She opens her great eyes and says without effort, "Sunday," the discussion upon the aural affections in hysteria continuing meanwhile undisturbed.

Suddenly Professor Charcot turns to the father : "Will you leave the child here ? She will be well cared for."

Oh, her terrified "No !" with her eyes on her father. And his tender smile of reassurance : "Don't be afraid, my darling !" It seems almost as if they divine by an instinct what her life in this house would be, where she would serve for an object of experiment and observation. Like the dogs

which are so well cared for as Sanfourche's. And like Daret and the rest who, after the out-patients are done with, will come in and show off for our benefit.

Daret is a tall woman of about 30, with a small head, wavy hair, a pale face, hollow cheeks, marks of pregnancy, and a chronic snuffle, as if she were about to cry. She is at home at the Salpêtrière, and appears in her petticoat with a shawl round her shoulders.

"Put her to sleep," commands the Professor.

The house surgeon steps behind the tall, thin creature and presses his hands for a moment upon her eyes. A sigh, and the deed is done. She is asleep, upright and rigid. The poor wretched body assumes every posture that we indicate. The extended arm remains extended; each muscle, lightly touched, contracts, causing the fingers, one after another, to close while the hand itself remains open and motionless. She has become the manikin of the artist's studio, but infinitely more docile and more supple.

"And deception is impossible," says Charcot. "She would have to know as much anatomy as we do."

A sinister figure this human automaton makes as, our chairs in circle round her, she obeys each command with docility, her face reproducing the expression proper to the gesture imposed. Her finger-tips at her lips to simulate a kiss, and her mouth expands in a smile which lights up her whole face. Then her fist is closed in an attitude of menace, and her forehead wrinkles and her nostrils distend in a paroxysm of anger.

"We can also do this," and the Professor raises her closed fist to strike, at the same time giving a caressing gesture to the other hand. The whole face instantly grimaces in a double emotion, both furious and tender; it becomes an infantile mask, laughing and crying at the same moment.

And all this while the German is busy with his tuning-fork and aural speculum, testing the ear with a long needle.

"We must not tire her," says the Professor. "Go and fetch Balmann."

But the house surgeon returns alone, evidently annoyed.

Balmann has declined to appear. She is furious because Daret was called in first. Between these two cataleptics, the Salpêtrière's best subjects, exists the jealousy of rival stars. Occasionally the entire dormitory is excited to madness by their disputes, couched in the language of the wash-house and interlarded with medical terms.

Failing Balmann, Fifine is brought in. She is a shop apprentice with a pink complexion, a little turned-up nose, a shrewish mouth, and the fingers of a dressmaker, roughened with needle pricks. She enters sullenly. She is one of Balmann's following and refuses to submit herself to treatment. The house surgeon tries vainly to induce sleep; she weeps and resists.

"Don't force her," says Charcot, and returns to Daret. She is quite rested and resumes the *seance* with much pride and snuffling.

Mysterious cataleptic sleep. Enveloping the patient with an atmosphere of illusion like a waking dream. An imaginary bird upon the window curtains is pointed out to her. Her closed eyes at once perceive both the bird and its movements. Her vague smile says: "Oh, how pretty!" and, in the belief that she is holding it, she strokes and caresses her own sheltering hand. Suddenly the house surgeon in a terrible voice says:—

"Daret! Look on the ground! There! In front of you! There's a rat! A snake!"

Behind her heavy closed eyelids she sees the thing shown her. And then follows a sublime mimicry of horror and terror such as neither Rachael, a Ristori, nor Sarah have ever surpassed. It is classic, too; the old human stereotype of fear, always expressed in the same way, contracting the arms, the legs, the entire being in terrified recoil and petrifying this pale, thin face, where nothing appears to live except the mouth, from which proceeds a long-drawn sigh of horror.

Ah, wake her, in pity's name! It suffices, however, to detach her vision by pointing out flowers on the carpet and asking her to pick us a nosegay. She kneels down and, still surrounded by this atmosphere of crystal which breaks at

a touch from the Professor or the house surgeon, she carefully binds her fingers with an imaginary thread and breaks it with her teeth.

We are in the midst of watching this unconscious pantomime when there is a sudden rattling noise in the passage outside and the barking of a hoarse cough.

"Fifine has an attack."

We rush out. The poor girl is lying on the flags in the passage. She is foaming at the mouth and writhing, her arms crossed, her muscles rigid, her body tense and so arched as to be almost off the ground.

"Nurses! Quick! Take her away and put her to bed!"

Four strong girls appear, very sane, very neat in their large white aprons. One, with a pretty country accent, says: "I can control her, M. le docteur." As they carry her across the courtyard they handle and control this bundle of riotous nerves which, with retracted head, is tossing and rolling in their arms. It is like the exorcism of one possessed—like the picture of the saint hanging on the wall in Charcot's room.

And Daret, meanwhile, whom we have quite forgotten? She is still asleep and has continued to pluck imaginary flowers and tie them up in little nosegays.

Lunch with the house surgeons in the over-heated waiting-room follows. As we eat our stewed scallops (traditional dish at the Salpêtrière) and drink the hospital wine, poured out for us by an old epileptic, we talk insanity, magnetism, suggestion, and so on. I amuse myself by telling these youths, whose point of view is so essentially rationalistic, a strange episode in my own experience; the history of three green hats bought by me in Munich during the war of 1866. These soft felt hats, the colour of old moss on wood, with a little bird with outspread wings and enamel eyes stuck in the band, were given by me to three of my friends, three good fellows of whom I was very fond. They were Charles Bataille, Jean Dubois and Andre Gill. They all died mad and, at different dates, I saw and heard all three of them rave out their several insanities under my Tyrolese hats with the little birds on top.

My story is received with politeness, but quite as a romance,

amid the smiles of the assembled table. After the coffee, pipes are lighted and the chief of Charcot's clinique suggests a walk through the insane quarter. Outside in the courtyard it is a bright winter's day, clear and cold. The sun warms the poor mad things who, clad in waterproof, crouch in the door-ways, isolated and silent, out of all touch with other human lives. Each is cloistered in her own delusion, the invisible prison against whose walls these poor sick brains beat themselves. Otherwise there is no sign of physical disorder ; the faces are quiet, the movements rational. Through the half-opened window of a downstairs room, I catch sight of a pretty girl, with bare arms and skirts pinned up, vigorously cleaning windows. She, too, is mad.

We pass into the next court. This is planted with trees and is more tumultuous. Two girls in blue overalls are sitting on the asphalt path which runs between the cells. They wear their hair down and they are both pretty and quite young. One of them is convulsed with laughter. She rolls herself from side to side and kisses her companion, a melancholy idiot with unseeing eyes, sunk in herself. Another girl, very tall and very excited, is walking furiously up and down. She comes up to us and, after demanding peremptorily of the house-surgeon : "What am I supposed to be doing here, Monsieur ? You may know, but I'm sure I don't !" turns her back on us and resumes her angry course.

Soon we are the centre of a curious, chattering crowd. A young woman in the short frock of a school-girl and a cotton bonnet of brilliant whiteness, tells us with dramatic gestures an incomprehensible story. She has such an air of prosperity and well-being that one might almost envy her. An old woman with a nut-cracker face, the sister of Louis XVI., as she assures us, aims her pleasantries at the house surgeon while, at an open door on the ground floor, a long face appears, sallow and wrinkled, and demands with an amiable smile :—

"Messieurs, I am an artist. Would you care to see my pictures ? But wait a moment while I put on my Tyrolese hat. I never paint without my Tyrolese hat."

The poor creature vanishes for a moment to reappear in

a little green felt hat with a bird on it, the exact counterpart of my Munich hats. The house surgeons are as amazed as I am myself at this strange coincidence, and the unhappy being, who exhibits two or three hideous daubs, seems quite pleased with our astonishment which she mistakes for admiration. In leaving, I notice numbers of these little mountain hats sketched in charcoal on the walls of the courtyard.

The gates are wide open. The wretched herd which follows us raves, bawls and jabbbers, apparently much interested in our departure. I glance back. On the threshold of the courtyard, which nothing guards but a great ray of sunshine like a barrier of light, the lunatics are drawn up, yelling and gesticulating. One of them, the old sister of the king, striking the attitude of a vivandière, with upraised arm and hand on hip, cries in a deep voice : " Vive l'Empereur ! "

Courtyard after courtyard ; trees, benches, waterproofs. Waterproofs are everywhere, fluttering in groups in the bitter wind or moving rapidly in pathetic isolation. Among these mournful visions of disturbed human equilibrium I note two silhouettes.

In the large workroom which Dr. Voisin calls his "senate," very light and very cheerful, where the patients sit in rows sewing and knitting, an ancient prostitute is standing alone at the window. Faded, withered and old, she never speaks except to call "Pst ! pst !" with the professional smile. This remembrance of a shameless gesture and intonation is all of her that remains alive. Oh, that pale face at the great, uncurtained window ! This mad-woman, this death's head still soliciting !

The other picture is less cruel.

"You see I am quite ready. I am just going," says a good-looking woman who is leaning against the wall in the entrance hall. In one hand she holds a nightdress bag, in the other a little bundle neatly pinned up in a cloth. The pleasant bourgeois face smiles round the circle and nods farewell.

And she does this all day long, has done it for ten years, and will go on doing it for who knows how many years to come !

SOME FURTHER REMARKS AND QUERIES CONCERNING THE INFLUENCE OF ALTITUDE UPON HEART DISEASE.

BY R. H. BABCOCK, M.D. (CHICAGO).

AT the New York meeting of this Association in 1899 I presented nine cases of cardiac disease upon which the effect of high altitude had been noted. In the consideration of the effect which had been exerted upon those cases, I advanced the theory that it was to be attributed to the acceleration of circulation, incident, as I believed, to lowered atmospheric pressure. Among my conclusions was one to the effect that stenosis of the mitral and aortic orifices contraindicated, theoretically, at least, residence at a high altitude.

In his discussion of my paper, Dr. Sewell very pertinently pointed out that he had under observation at that time a female, with pure mitral constriction, whom I had previously treated in Chicago, and who was able to bear the altitude of Denver apparently without ill effect. At Cripple Creek, which was more than twice as high as Denver, she was short of breath. Nevertheless, as Cripple Creek was hilly, and the patient did considerable walking, it was presumable that her dyspnoea was owing not so much to the altitude as to the fact of exercise at that height on uneven ground.

This observation was a contraindication of my assumption regarding the inability of patients with mitral narrowing to endure elevated climates. During the past four years I have observed two other instances of pure uncomplicated obstruction at the mitral orifice, both in females, who declare they feel far better in the mountains of Colorado than at Chicago. One of them suffers from asthmatic breathing at her Chicago home, whereas she is free from it in the Rockies. It is very possible, therefore, that her comfort in Colorado may be due to her immunity from her asthma; but one may ask, is not this immunity due to some, as yet not understood, influence on her circulation? Moreover, when in the mountains, even at a height of 10,000 feet, she takes very little active

exercise, whereas at home she does considerable walking. So that this fact must also be taken into consideration in its bearing on her greater comfort in Colorado.

The other lady, who likewise declares she feels well in the Rocky Mountains, experiences pronounced lassitude in Chicago, whilst in Colorado she feels stimulated and energetic. She does not remain especially inactive, therefore, at that altitude, as does the former lady.

In marked contrast to these are two other individuals whom I have recently observed. Neither has valvular disease, so far as can be determined. One is a lady of 53, who suffered much from menorrhagia during a number of years at the time of the menopause, and became anæmic, but did not, so far as could be learned, exhibit signs of cardiac inadequacy. Last summer she went to Colorado Springs to remain for a number of weeks, but at the end of forty-eight hours was so out of breath and oppressed as to be compelled to consult a physician. Dr. Swart saw her, and, as she stated to me, found the action of the heart so disordered and the organ so dilated that he advised her immediate return home. His advice was acted upon, and soon, after reaching a lower level, her symptoms disappeared. Nevertheless, a subsequent cardiac breakdown occurred, from just what cause could not be ascertained, but apparently in consequence of exertion, which, although not in itself excessive, was yet relatively too great for her heart. It was because of two attacks of pulmonary œdema that I was asked to see her in consultation. The condition as I saw it was a considerable degree of cardiac dilatation, especially of the right heart, with a strikingly small, weak pulse, but without turgescence of the superficial veins other than the external jugulars. It seemed as if the stasis was chiefly in the large distensible veins of the abdomen, including those of the liver.

The second case of this latter group is that of a man of 38, who has lived in Montana at an altitude of four to six thousand feet for the past eighteen years, where he has been engaged in mining. The symptom for which he was sent to me was a dull præcordial pain, which, together with rapid

action of the heart, was noticed for the first time fifteen years ago, after he had done much climbing of ladders in the mines. His recovery from these symptoms was followed by an immunity lasting fifteen years. Last fall, however, his præcordial pain had returned, about a week after a pretty stiff climb over the mountains. When I examined him for the first time, it was some weeks after he had been in Chicago, and my examination was not very fruitful. Nevertheless, I came to the conclusion that there was a slight degree of cardiac dilatation, and hence expressed the opinion that he had suffered a cardiac overstrain. Very recently he returned with the statement that upon going back home and resuming his active habits he had again felt the dull præcordial pain. He then left that altitude, and upon reaching Missouri lost his annoying symptom. This time it was quite apparent that the transverse diameter of the heart was much too great, and that the right ventricle was dilated, as shown by percussion and an epigastric pulsation. But the observation that chiefly interested me was his low arterial pressure. Blood pressure, as registered by Gaertner's tonometer, was 85 mm. of mercury, whereas normally it is between 100 and 130. The pulse rate, even allowing for his nervousness, was much too rapid, and the low blood-pressure was further evinced by a feeble aortic second tone. The radials were only slightly stiff. I saw no reason in that fact, however, to conclude that there was sclerosis of the aorta and chronic myocarditis. I still look upon the condition as one of cardiac overstrain, incident to exertion at an altitude, and not to the altitude *per se*, since he must have become accustomed to the lowered atmospheric pressure after a residence of eighteen years.

Now, before putting forth any queries or attempting to account for the effects in these four cases, let me briefly refer to a statement made to me by the late Dr. C. W. Purdy, of Chicago, relative to the danger of high altitude in some cases of chronic interstitial nephritis. Purdy said he had known more than one patient with renal disease to develop alarming uræmic symptoms after a few days in Denver, although in Chicago their kidneys had been equal to th

work put upon them. He had consequently come to believe a trip to the Rocky Mountains extremely hazardous for chronic nephritics.

With the foregoing briefly narrated facts before us, can any one offer an explanation of the differing effects experienced in the case given? Are they all explicable on the same hypothesis? For my part, I frankly confess to being up a stump, and yet I incline to the view that different factors were at work. Let us take the effects upon chronic nephritis first. In this disease there is high blood-pressure, which, however brought about, is nevertheless salutary, since without it in the renal artery urinary excretion would lessen and dangerous symptoms would develop. Since at a high altitude blood-pressure is diminished, are therefore uræmic symptoms to be attributed to a fall of arterial pressure? or are we to look for these effects in an increase of metabolic activity, in consequence of which the damaged kidneys become unequal to the demands put upon them? We cannot hold, I think, that the function of the skin is less active in the dry air of the mountains. On the contrary, although the skin feels dry, evaporation is really more active than in the damper atmosphere of lower regions, and if such is the case, then the work of the kidneys should be lessened. It seems to me that the explanation must be sought either in diminution of blood-pressure in the renal artery, or in a more active metabolism. Can any of our Colorado friends tell us whether, as a matter of fact, the mean blood-pressure of individuals living at Denver or higher is less than among residents of the plains? If not, a series of observations would be of great scientific interest and value. Since uræmic manifestations are said to be experienced soon after chronic nephritics reach that altitude, may it be that dangerous symptoms occur because time has not been allowed for the circulatory system to adjust itself to the altered barometric conditions, and that this fact, if a fact it is, acts in conjunction with increased metabolism. I confess I incline to this latter explanation, and to lay more stress upon metabolism than upon alteration in blood-pressure. If such be the case, it does not help us to understand the cases narrated.

For instance, let us turn to the case of the miner who has resided at a more or less considerable elevation for the past eighteen years. His initial symptoms developed at Butte, Montana, at an altitude of 4,000 feet, after he had done much ladder climbing. They were tachycardia and præcordial pain. Then after their cessation followed a respite of fifteen years, when they recurred about a week after he had climbed a mountain on foot, and for a part of the way carried a grip. The maximum altitude was 8,000 feet at this time.

Although his blood-pressure was low soon after his descent from the altitude of Montana to the low level of Missouri, I yet believe that in this instance his symptoms were a direct result of heart-strain and not of the lowered atmospheric pressure *per se*. Cardiac strain appears to be easily induced in the rarefied air of the mountains, but had this man not subjected his heart to strain, I believe the altitude itself would not have affected him, and in reality did not affect him. This case may be dismissed, therefore, except in so far as it bears on the subject of cardiac strain in the mountains.

Let us now turn to the middle-aged woman who got up a dilatation of the right ventricle at the altitude of Colorado Springs. She is positive that she did not commit any conscious over-exertion, and yet she did not refrain from physical effort before becoming accustomed to the altitude. Was this also a condition of cardiac strain merely? If so, why did her heart quiet down on reaching the plains?

I am at a loss to account for her experience, unless possibly upon the hypothesis that when she went to Colorado she had already had an abnormally low blood-pressure and that the injurious effects of habitually low arterial pressure were intensified in the light air of the mountains. Such an explanation seems to me not unreasonable, and hence I should greatly like an expression of opinion on this point.

Granting, for the sake of argument, that habitually low blood-pressure was the cause of this woman's unfortunate experience, can it have any bearing upon my two cases of mitral stenosis? In the case of my patient with this form of disease whom Dr. Sewell observed, the sphygmograph

had shown a small, tense, radial pulse. Now, I believe that it is stated that some patients with mitral stenosis display a tense pulse of capillary origin, the constriction of the capillaries being itself due to the state of the splanchnic nerves. If such is the case, does it throw any light on the ability of some of these patients to endure and even improve at an altitude? Or did these patients feel better simply because they were less active than when at home?

Since this paper was begun I have seen another female with what I take to be a mitral narrowing with a patent foramen ovale of congenital origin, whose history is interesting in its relation to altitude in cardiopaths. Prior to six years ago she had not experienced symptoms of cardiac incompetence. At that time she visited in California, going into the mountains, where she indulged in much equestrian and other exercise, without, she asserts, any discomfort. Upon going to San Francisco she promptly had a severe attack of what was thought to be asthma, but from her description appears to have been an acute pulmonary oedema. Since that time she has been subject to frequent recurrences of her so-called asthma, in consequence, seemingly, of exertion, although other factors also appear to influence its production. Two years ago she was in Asheville, N.C., and there was able to ride horseback, which she says she cannot do at Chicago.

The physical signs of her cardiac disease do not need to be stated, but it may be said that at the time of my first examination her blood-pressure, as registered by Gaertner's tonometer, was 147 mm. of mercury. This was not very high, and yet was higher than normal, which is from 100 to 130 mm. Such high arterial pressure was not maintained, however, for upon being given a cathartic and being put to bed it fell to 125 mm. of mercury.

Now what may we assume from this case? Was hers a condition of overstrain in the mountains which declared itself only after she reached sea-level? Or was she able to exercise in the Californian mountains and again in Asheville and not at sea-level, because she had habitually high blood-pressure? And if so, why had she not experienced difficulty prior to her

Californian mishap? Why can she ride in Asheville at an altitude of only 2,500 feet and not in Chicago? At first I inclined to the belief that an abnormally high arterial pressure had something to do with it, but now I incline to the view that her attacks of dyspnoea are of a mixed type. That is that, although they appear to be a cardiac rather than a spasmodic asthma, there is, in addition, some other factor at work which is not active in the mountains. It required a condition of cardiac overstrain to develop her asthmatic tendency, and that having been once established other influences, whatever they may be, are now capable of initiating an attack. Like the other female, she is well in the mountains, or rather was well in Asheville, simply because these factors were not active.

Are we to seek the explanation of one person's ability to endure altitude and another's inability to endure it in conditions of blood-pressure, or must we conclude that, as stated by Regnard, any one can reside at an altitude of a mile or so, after he has once become accustomed to it, *i.e.*, acclimatised?

It seems to me it would be well if our Colorado colleagues would make it a rule to record the blood-pressure in newcomers, and especially those exhibiting signs of cardiac distress, and compare these with observations made after the same persons had grown accustomed to the altitude. A consideration which seems to argue against a person's tolerance or intolerance of moderate altitude being due to the blood-pressure lies in the generally accepted statement that the pulse of the consumptive is one of low tension, and yet most of such patients are able to endure residence in Colorado at an elevation of a mile without serious cardiac embarrassment. Is this observation correct, I should like to ask? If a certain number of tuberculous subjects experience cardiac discomfort in Colorado, are they, I enquire, those in whom the pulse tension is noticeably low?

As already stated, I am at sea in this matter, and am growing to believe that, if a cardiopath will remain inactive until accustomed to the altitude, he can visit the mountains and journey to California with immunity from symptoms. The danger of travel and residence at an altitude appears to be really

greater in the case of apparently healthy hearts, since such individuals are likely to over-do and, therefore, get up a condition of cardiac overstrain, and that in all cases it is not so much the altitude itself which is to be feared as it is the ease with which the heart may be overstrained in the mountains. This strain is itself not due so much to the altitude as it is to the fact that in the higher regions the surface of the ground is uneven and hilly. In short, given a rarefied atmosphere, with hills to surmount, the heart becomes more easily overtaxed than at the sea-level, and hence signs of cardiac embarrassment, and even incompetence, develop which would not appear at home.

A NOTE ON THE RELATION OF NEURALGIA TO ALTITUDE, WITH REPORT OF TWO CASES.

BY F. SAVARY PEARCE, M.D. (PHILADELPHIA). .

THOUGH men of equal merit and located in various parts of the United States regard this subject in radically different ways, yet there must be a definite relation as cause and effect between pain, storms and altitude. Furthermore, barometric pressure must be the main factor influencing pain of so-called functional disease, as well as a modifying element of pain due to organic disease, as, for example, the root pain of ataxics.

This short contribution is made in order to record two cases, one of hystero-neurasthenia, and the other of neurasthenic-hypochondria; both patients suffering from intense facial neuralgia, but not so persistent as to warrant a diagnosis of *tic douloureux* in either case. The subsequent histories of both cases prove them to have been curable symptoms.

CASE 1.—M. R., a hysterical girl, aged 18, has been suffering from intense facial neuralgia of the inferior branch of the fifth nerve for three years. The damp country up the Schuylkill Valley in Pennsylvania, where she had always lived, was a menace to the curing of the real pain which she had in the face, although she was a neurotic, it must be said. After trying a number of analgesic remedies with due caution, to their full limit, I made up my mind that change of altitude to a dryer and warmer climate during the winter months would be the best remedial measure to institute. The patient was willing for any reasonable experimental measure in therapeutics.

We sent the young lady, accordingly, to Tyron, North Carolina, in a temperate climate at an altitude of 1,050 feet. The pain was eased from the day of her arrival in the South, where she subsequently made rapid improvement. The balmy atmosphere, which is here ten degrees warmer than that in the vicinity of Asheville, North Carolina, much aided in relief of her pain, no doubt. When, however, she went 2,500 feet

above sea-level at Hendersonville a month later, the patient became distinctly worse immediately, as to the neuralgia. I believe this excludes psychic effect in the case. After returning to Tryon, the original lower altitude of 1,050 feet, she has been delighted with her relief again from suffering; a few weeks later she seemed to be cured absolutely of her pain. A recent letter is confirmatory of her well-being now, six months since she left Pennsylvania.

CASE 2.—Dr. S. L. W., aged 60, was referred to me by Professor L. Webster Fox, who had found nothing in the eyes to account for headache of neuralgic type involving the supra-orbital branch on either side. This man had passed into a miserable neurasthenic, hypochondriacal state, the result of overwork and worry associated with the distress of a most persistent diurnal paroxysmal pain which at times amounted to acute agony. Doctor-like, he had used most of the remedies in the pharmacopœia on his own account. The first suggestion from me was to drop all medication, in order to see where we stood in the matter, although it should be stated that the physician was not taking medicine at the time he first came for treatment in January, 1902, the pain the while persisting as indicated above. This, with the general neurasthenic condition of the man and the nature of his suffering, made for a diagnosis of supraorbital neuralgia. I tried the mono-bromate of camphor in 3-grain doses every three hours when the paroxysms returned, with some betterment during the first few weeks of his visits. During this time the general therapeutic régime was towards the upbuilding of his constitution, through abundance of milk and the avoidance of dietetic indiscretions. There was no indication in the urine to show evidence of toxæmia, and the intestinal tract seemed to be in perfect function. We also administered the hypophosphites, and treated him with electricity down the spine thrice weekly with the idea of bettering his nervous tone. After these ministrations for six weeks, I found that while his general condition was better the symptom pain still persisted. This man had tried the climate of Denver, and whilst there he said the pain was much more severe than when in Philadelphia,

practically at the seashore level. The observations of this patient, who is a very intelligent man, made me again think over the problem of altitude as related to pain.

These two cases above recorded, coming in close succession, and of the same disease distinctly made worse by sudden ascent (in the first case, 2,500 feet above sea-level, and in the second case of a mile above sea-level at Denver), were striking examples of reversed conditions of pain I had noted in a previous paper, wherein the pain of tabes was noted to be bettered by high altitudes.¹ The thought has come to me in explanation of this matter, that in essential neuralgia, so-called, as these two cases are, a sudden lowering of atmospheric pressure produces a congestion of the superficial facial tissues, and, therefore, irritation of the peripheral supersensitive sensory neurons in the patients. Any sudden reduction of atmospheric pressure would, therefore, through such engorgement *per se*, and also, no doubt, through the retention of waste products within the blood pabulum, cause an irritation which would be harmful in neuralgia. In the cases of posterior sclerosis to which we have referred, where the pain was bettered by this same reduction of atmospheric pressure through altitude, it would seem to the writer to be explained by the fact of the reduction of pressure upon the surface of the body relieving in consequence the congestion about the nerve roots, which is the partial cause of the pain in tabetics.

The subsequent histories of the two patients recorded above show that they are distinctly better of the neuralgia at the present date, both as to severity and as to prolonged intervals of attack. In both cases, too, Philadelphia and vicinity was not a good climate for them, the young lady being very well indeed at the low altitude in North Carolina; the physician, from whom I received a letter recently, being greatly benefited by a sojourn to St. Louis, Missouri.

There are other considerations of meteorological nature which undoubtedly must be brought into account in studying

¹ "A Study of the Diagnosis, Etiology, and Treatment of Tabes Dorsalis, with Special Reference to Precocious Locomotor Ataxis and the Argyll-Robertson Symptom," *Therapeutic Gazette*, October 15, 1898.

pain. We believe that careful scientific observations of this subject in the future, taken upon a large scale in various parts of the country, will be productive of great good, for we feel confident that there is much to be learned in such careful observation of climatology of disease.

Dr. S. Weir Mitchell, the pioneer in the study of the relation of pain to storm centres, has continued his studies in a recent contribution before the College of Physicians of Philadelphia¹ (May 6, 1903), and finds that with the advent of storm conditions, which imply lower barometric pressure, headaches are aggravated. This observer also notes on a carefully prepared chart that chorea is likewise more prevalent during the same atmospheric state, *i.e.*, one of lowered air pressure.

Some observations we made for Dr. Mitchell, which are recorded in his "Clinical Lessons," also bear out the idea that no doubt increase of blood pressure from any cause will excite or increase pain, when it is due originally to pressure from force behind (*vis a tergo*), producing superficial sensory disturbance; for in the cases of erythromelalgia recorded there as indicated, when the limb was pendant, the pain was excited immediately, and there was a rise of the superficial temperature of the foot affected. The whole subject is one of intense interest to medicine, and to the patient sufferers from disease.

¹ "The Relation of Headache to Storm Conditions."

BRITISH BALNEOLOGICAL AND CLIMATOLOGICAL SOCIETY.

COPY OF MINUTES.

GENERAL Meeting, held at 20, Hanover Square, on Wednesday, May 31, 1905.

Dr. BAGSHAWE took the chair, owing to the absence of Dr. Bowen Davies through illness.

The Minutes of the last meeting were read and confirmed.

The SECRETARY read a letter from the President stating his regret that he was prevented by illness from attending the meeting.

A letter was read from Dr. Wm. Murray, stating that he had met with an accident, and was therefore unable to attend the meeting to give the address, but had sent the paper to be read.

The following candidates were elected Fellows of the Society :—

William Alexander, M.A., M.D., Bournemouth.

Henry Overton Hobson, M.D. Edin., Helouan.

Alfred Samuel Gubb, M.D. (Paris), L.R.C.P., D.P.H., Algiers.

Dr. Shirley Jones and Dr. Percival White were appointed Scrutineers of the ballot papers for the election of the officers and Council for the ensuing session.

Drs. Alex. Morison and Delbruck were elected Auditors of the accounts for the past session.

The following report of the Council was read and adopted :—

Report of the Council on the Work of the Society during the Past Session, 1904-5.

The Council are pleased to present to the Fellows of this Society a report on the work and progress made during the Tenth Session.

Six meetings have been held, four in the afternoon, and two in the evening, and have been well attended. The President, Dr. W. Bowen Davies (Llandrindod Wells), has proved a worthy successor to the many distinguished Fellows who have preceded him. He took as his Presidential address "The Spa Treatment of Arthritis Deformans," which proved of great interest to those present.

During the session, papers have been read by Dr. N. HAY FORBES (Tunbridge Wells), entitled "Observations on the Climate and Health Resorts of Scotland," which gave rise to an animated debate, and supplied facts concerning the climatology of that portion of the United Kingdom which were not included in the report of the Royal Medico-Chirurgical Society. Dr. CHARLES W. BUCKLEY (Buxton) read a paper on "Climatology from a Medical Standpoint," which formed the subject of an interesting discussion. Dr. LEONARD WILLIAMS also opened a discussion on "The Ethics of Health Resort Treatment," and Dr. HENRY MCCLURE read a paper entitled "The Climatology of the Sahara."

To-day Dr. W. MURRAY (Newcastle) will deliver an address entitled "The Limitations of Treatment."

It is with much regret that the Council have to report the death of several Fellows of the Society, notably that of Dr. Vivian Poore, an Honorary Vice-President of the Society, whose decease is a great loss, not only to this Society, but to medical science in general.

Eleven new Fellows were elected during the session, and the total number of Fellows is now 374.

The Council would be very pleased if the Fellows would introduce the objects of the Society to those of their friends who are interested in the subjects of Balneology and Climatology, so that the number of Fellows may be largely enhanced during the coming session.

From a financial point of view the Society is in a fairly flourishing condition, but it would greatly assist the funds if more advertisements could be obtained for the Journal, which by this means the Council would be glad to see self-supporting.

The List of Officers and Council was then duly elected (see List of Members).

Dr. LEONARD WILLIAMS then read the address of Dr. Wm. Murray, entitled "The Limitations of Treatment," which was received with great interest.

Dr. SYMES THOMPSON proposed, and Dr. BAGSHAW seconded, a vote of thanks to Dr. Wm. Murray.

Reviews and Notices of Books.

THE CARE AND MANAGEMENT OF DELICATE CHILDREN. By Dr. Percy Lewis. (Cassell and Co., 1905).

The author of this work, who has already published several excellent manuals, is to be congratulated upon the thoroughness with which he has dealt with an important subject. The book is not large (it is well printed and well bound) and yet it contains more than the essentials of the subject.

The deterioration of the race, which is becoming an increasingly important question in France and England, is due in a very large measure to the carelessness and ignorance which prevails in the upbringing of children. If the sapling is bent, the mature tree is crooked indeed. The want of a little knowledge and a little common-sense has ruined many a life which might otherwise have been happy and useful, and while ignorance is bad enough, fussiness is even worse. Parents, especially of the upper classes, find it difficult to believe that their child is a young animal first, and anything that they can make of him afterwards, and if they make him a fine young animal, they give him every opportunity of developing the faculties, mental and moral, which fit him for a useful career in the world. Many a plant will flourish by the roadside which dies of inanition when brought into the greenhouse. And so it is with children, if they are treated as exotics they fail in development. Dr. Percy Lewis's book constitutes an admirable corrective against both these extremes; and although it is addressed to the profession, it might very profitably be placed in the hands of all who have the care of children.

The ordinary nursery nurse appears to be in Dr. Lewis's eyes the cause of much of the trouble which we all deplore, and there can be no doubt that he is right. If before being allowed to have the charge of children the ordinary nursery nurse could be made to pass an examination in the principles set forth in this book, we should hear less of chorea, rickets and nerves in children than is now unfortunately the case.

The appendix describes some admirable exercises which are quite easily performed without any special apparatus. There is a good index.

GLOSSAIRE MÉDICAL. By L. Landouzy, Professor of Clinical Medicine to the University of Paris, and F. Jayle, Chef de Clinique gynécologique de la Faculté de médecine de Paris. (Manson and Co., Paris, 1902.)

Littre says that a dictionary is a book intended for the use of contemporaries. This book is not a dictionary, but it is

emphatically intended for the use of those who are engaged in the study of medicine and allied sciences at the present day. It comprises explanations of current medical expressions in anatomy, physiology, medicine and surgery and their congeners. It also gives full explanations of words which, as the result of medical and other scientific discoveries, have been evolved in the course of the last ten or fifteen years. It is only necessary to mention in this connection asepticism, bacteriology, serum, therapeutics and the like. The volume also deals in a very exhaustive manner with the names of men who have given their title either to a disease or to medical or surgical methods. It is the fashion to deprecate this type of nomenclature of disease and method, but in their preface the present authors defend the practice in a most unanswerable manner. "What, for example," they seem to ask, "should we do without such expressions as Addison's disease, Jacksonian epilepsy, Hilton's method, Dupuytren's disease, and a host of others?" Each one of these expressions (and others could be mentioned) saves the trouble of trying to express the exact nature of a disease about which in many cases very little is known. The method, moreover, has the inestimable merit of saving us from the necessity of committing ourselves to any theory as to the nature of a complaint under consideration. Addison's disease is a good example. We know it as a clinical entity; but no one has so far been able to explain either the *materies morbi* or its method of action. It is unnecessary to multiply instances, but Jacksonian epilepsy is another very good one.

The glossary not only tells us the names of people who have described diseases, but it also tells us some particulars about the life of the individual, the country of his origin, and the dates of his birth and death. Another great advantage of the glossary is that it gives a fairly complete list of French health resorts, indicating briefly the therapeutic value of each. It also explains the meaning of various balneary and climatic terms. The work is, of course, in the French language, but English readers who have but a very slight acquaintance with that language would find it a most useful and reliable addition to their works of reference. It is well illustrated, the type is clear, and the language simple.

THE NATURE AND TREATMENT OF CANCER. By John A. Shaw-Mackenzie, M.D.Lond. (London: Baillière, Tindall and Cox, 1905.)

This volume is in reality a new edition of a work by Dr. Shaw-Mackenzie, entitled "Some Methods of Hypodermic Medication in the Treatment of Inoperable Cancer," which we noticed not long since. It is a small volume of only 80

pages, and its moderate price of half a crown should recommend it to all. The problems which confront us in connection with cancer are so numerous and so difficult that a study of the question such as this lucid and altogether scientific work presents is one which should commend itself to every medical practitioner.

The nature of cancer and its amenability to treatment by hypodermic injections of sodium oleate and trypsin, and the various stages which have led the author to adopt these methods, are of the greatest interest, and his results should certainly be carefully considered and honestly tried by all those who have suitable cases under their care. The technique of the author's methods are not altogether simple to those who are not accustomed to hypodermic injections, but careful study of the instructions which he gives should prevent any difficulties under this head.

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 1900 FRASER, Forbes, F.R.C.S., L.R.C.P., 2, Circus, Bath.
 1896 FRASER, John Hosack, M.B., F.R.C.P.Ed., Fernfield, Bridge of Allan, N.B.
 1900 FROST, Edward, M.D., Chesterfield, Chesterfield Road, Eastbourne.
 1899 FURNER, Willoughby, M.D., F.R.C.S., "Greenlands," Burgess Hill. C. 1900-01.
 1897 GAIRDNER, Matthew W., M.B., L.R.C.S., L.M., 128, Rione Amadeo, Naples.
 1896 GARDNER, J. Twiname, M.R.C.S., L.R.C.P., 5, Embankment Gardens, Chelsea, S.W.

- 1900 GARDNER, T. Fred, M.D., M.R.C.P., M.R.C.S., The Moyne, Boscombe Spa Road, Bournemouth.
- 1897 GARDNER, Wm. Thomas, M.B., L.R.C.P., M.R.C.S., Fairseat, Poole Road, Bournemouth.
- 1897 GIBSON, Charles, M.D., L.R.C.P., Victoria Avenue, Harrogate.
- 1899 GOFF, Bruce E., M.B., 15, Pembridge Gardens, W.
- 1896 GORDON, H. Laing, M.D., Via Palestro A, Florence. C. 1897-99.
- 1901 GORDON, William, M.D., M.R.C.P., 3, Bamfield Crescent, Exeter.
- 1905 GORE, W. Ringrose, M.B., B.Ch., Llandrindod Wells.
- 1901 GRANT, J. W. Geary, L.R.C.P., M.R.C.S., The Hall, Llanwrtyd Wells.
- 1902 GREEN, George R., L.R.C.P., L.M., M.R.C.S., 7, Park Street, Ripon.
- 1896 GREENWAY, Alfred G., M.D., M.Ch., Plas de Winton, Llandrindod Wells.
- 1896 GRESSWELL, Albert, M.A., M.D., Louth.
- 1896 GREVES, Hyla, M.D., M.R.C.P., Rodney House, Poole Road, Bournemouth.
- 1898 GREY, Harry, M.D., C.M., Kingsbridge, S: Devon.
- 1902 GRIFFITHS, John, M.R.C.S., L.S.A., Llandrindod Wells.
- 1896 GROVES, Joseph, M.D., F.G.S., J.P., Glenmount, Carisbrook, Isle of Wight. C. 1901. V.P. 1902-
- 1905 GUBB, A. S., M.D.(Paris), L.R.C.P., D.P.H., Mustapha Superieur, Algiers, and Aix les Bains.
- 1897 GUILLEMARD, B. J., M.D., C.M., M.R.C.S., Aliwal North, Cape Colony.
- 1896 HABGOOD, Henry, M.D., L.R.C.P., Stafford House, Eastbourne. C. 1901-3.
- 1895 HALDANE, William, M.D., F.R.C.P., Viewforth, Bridge of Allan, N.B. C. 1895-1900. V.P. 1895-
- 1901 HALL, Octavius, L.R.C.P., L.R.C.S., D.P.H., 7, Clarendon Terrace, Stoke, Devonport.
- 1897 HANDS, Charles H., M.B., M.R.C.S., Glendalough, Totland Bay, Isle of Wight.
- 1896 HARBORD, Augustus, M.R.C.S., L.R.C.P., 36, Bedford Square, W.C.
- 1902 HARBURN, John English, L.R.C.P., L.R.C.S., Crescent View, Buxton.
- 1896 HARDWICK, Arthur, M.D., Prospect House, Newquay, Cornwall.
- 1896 HARSANT, Joseph George, The Hive, Exeter Road, Bournemouth. C. 1897-1900.
- 1901 HARTLEY, John, M.B., L.R.C.P., Lismore House, Buxton.
- 1897 HAVELL, C. G., L.R.C.P., M.R.C.S., Felixstowe. C. 1898-1901.
- 1903 HAWORTH, John T., L.R.C.P., L.R.C.S., Rutland Lodge, Filey, Yorks.
- 1900 HAWTHORN, C. O., M.D., M.R.C.P., 63, Harley Street, W.
- 1901 HAYWARD, John W., M.R.C.S., L.S.A., Western House, Whitstable.

- 1901 HEANEY, Fras. J. S., M.A., M.D., F.R.C.S., 3, Brighton Parade, Blackpool.
- 1897 HEDLEY, W. S., M.D., 21, St. John's Wood Park, N.W.
- 1900 HEMMING, John J., M.R.C.S., L.S.A., 2, Grosvenor Villas, Eaton Road, Margate.
- 1896 HERBERT, Alfred C., L.S.A., J.P., Southwold.
- 1902 HEWLETT, Wm. Hy., M.D., D.P.H., Wivenhoe, Essex.
- 1900 HILL, G. William, M.D., 26, Weymouth Street, W.
- 1896 HILLYER, W. H., M.R.C.S., Heathcote, East Grinstead.
- 1898 HIND, Harry, F.R.C.S., Blythholme, Victoria Avenue, Harrogate.
- 1905 HOBSON, H. Overton, Villa Sakhara, Helouan, Egypt (November to April ; and 32, Upper Berkeley Street, W.
- 1896 HOBSON, Lewis John, M.D., B.S., F.R.C.S., 30, Swan Road, Harrogate.
- 1896 HOLBECH, Arthur O., M.R.C.S., L.R.C.P., Abbotsfield, Great Malvern. C. 1902-03. V.P. 1903.
- 1897 HOLLAND, James Frank, M.D., R.U.I., St. Moritz, Engadine.
- 1902 HOLLIS, Alfred, M.D., Tower House, Freshwater, Isle of Wight.
- 1896 HOSKER, J., M.R.C.S., Kirkleatham, Boscombe, Bournemouth. C. 1900.
- 1898 HOUCHIN, E. King, L.R.C.P., L.M., L.R.C.S., Ravensworth, Cranbrook Road, Ilford, Essex.
- 1897 HUNTINGTON, William, M.R.C.S., L.R.C.P., 43, South Street, St. Andrews, N.B.
- 1896 HUSKIE, David, M.A., M.B., C.M., Moffat.
- 1898 HUTCHINSON, Roger J., M.R.C.S., L.R.C.P., Lowside, Haslemere.
- 1895 INGLIS, Arthur Stephen, M.D., 5, Pevensey Road, St. Leonards-on-Sea. C. 1899-1901.
- 1895 INGLIS, John, M.A., M.D., 18, Cornwallis Gardens, Hastings. C. 1896-99. V.P. 1895-
- 1897 IREDALE, J., L.R.C.P., L.R.C.S., Mablethorpe, Lincolnshire.
- 1904 JAFFREY, Francis, F.R.C.S., L.R.C.P., 33, Nottingham Place, W.
- 1899 JAMES, Alexander, M.D., F.R.C.P., 10, Melville Crescent, Edinburgh.
- 1896 JOHNSTON, George F., M.D., M.R.C.P., 3, Montagu Place, Montagu Square, W.
- 1895 JOHNSTON, Thomas, M.D., M.R.C.P., Annandale, Ilkley. C. 1896-97.
- 1897 JOHNSTON, Wm. A., L.R.C.P.I., L.R.C.S.I.
- 1895 JONES, H. Shirley, M.R.C.S., L.S.A., Ravenstone, St. Andrew's Road, Droitwich. C. 1895-98. Sec. 1898-
- 1897 JONES, M. Handfield, M.D., 35, Cavendish Square, W.
- 1897 JONES, William Black, M.D., B.S., D.P.H., Llangammarch Wells, Breconshire. C. 1898-
- 1900 JOSEPH, A. Hill, M.D., Glanmot, Cantelupe Road, Bexhill-on-Sea.

- 1896 KEETLEY, C. R. B., F.R.C.S., 56, Grosvenor Street, W. T.
1896-99. V.P. 1899-
- 1896 KERR, J. G. Douglas, M.B., C.M., J.P., 6, Royal Circus, Bath.
C. 1896- V.P. 1898-1900. P. 1901-02.
- 1895 KINGSBURY, George C., M.A., M.D., 1, Elm Court, Temple, E.C.
C. 1895-98.
- 1898 KINGSCOTE, Ernest, M.B., C.M., 31, Lower Seymour Street, W.
- 1898 KNOTT, William, L.R.C.S., L.R.C.P., 1, Rycroft Street, Fulham.
- 1902 KNOWLING, Ernest Mansfield, M.B., B.A., M.R.C.S., North Bay
View, Tenby.
- 1897 KROHN, Ronald E. S., M.D., M.R.C.S., Funchal, Madeira.
- 1904 LACEY, Alex. Gairdner, L.R.C.P., M.R.C.S., Sunninghill, Ascot.
- 1899 LARKING, Arthur E., M.D., M.R.C.S., D.P.H., 1, London Street,
Folkestone.
- 1905 LAVIS-JOHNSTON, H. J., M.D., D.Ch., M.R.C.S., Villa Lavis,
Beaulieu, Alpes Maritimes; and Villa Minima, Vittel
Vosges.
- 1898 LAWRIE, Macpherson T., M.D., "Greenhill," Weymouth.
- 1899 LEIGH, John Dickinson, M.B., F.R.C.S., 7, Avenue Road, Scar-
borough. C. 1901-02.
- 1898 LEON, George A., M.A., M.D., D.P.H., Hillsdon, Sidmouth. C.
1899-1902. V.P. 1901-
- 1902 LEON, John Temple, M.D., B.Sc., D.P.H., Elmwood, Grove
Road, Southsea.
- 1897 LETTERS, Patrick, M.D., D.S.M., D.P.H., Valentia Island, Co.
Kerry, Ireland. C. 1898-1900.
- 1902 LEWIS, Ernest E., M.D., M.R.C.S., L.R.C.P., 30, Weymouth
Street, W.
- 1895 LEWIS, Percy George, M.D., M.R.C.S., 22, Manor Road, Folke-
stone. C. 1902-
- 1901 LITTLE, James, M.D., F.R.C.P., 14, Stephen's Green, Dublin.
C. 1902- V.P. 1901.
- 1897 LIVESEY, Edgar William, L.S.A., Alderney, Channel Islands.
- 1900 LORIMER, George, M.A., M.D., 9, Terrace Road, Buxton.
- 1896 LOVE, William, L.R.C.S.I., L.M., Manor House, Hoddesdon.
- 1896 LOWE, George May, M.D., F.R.C.P., 101, Alexandra Terrace,
Newport, Isle of Wight.
- 1896 LOWE, T. Pagan, M.R.C.S., 16, Circus, Bath.
- 1900 LOWTHER, Richard, M.D., M.R.C.S., Fernleigh, Grange-over-
Sands.
- 1898 LUFF, Arthur P., M.D., F.R.C.P., M.R.C.S., 9, Queen Anne
Street, W. T. 1899-1901. C. and V.P. 1901-02.
- 1897 LYDDON, Richard, M.R.C.S., L.S.A., Cavendish House, Victoria
Parade, Deal.
- 1899 LYON, Thomas Glover, M.A., M.D., M.R.C.P., 1, Victoria Square,
S.W.
- 1896 LYS, Henry Grabham, M.D., Southbrook, Poole Road, Bourne-
mouth.
- 1904 MACBRYAN, Henry C., L.R.C.P., L.R.C.S., Kingsdown House,
Box, near Bath.

- 1901 MACDOUGALL, John A., M.D., 3, Rue Herman, Cannes.
 1900 MACFIE, Ronald Campbell, M.A., M.B., C.M.
 1897 MACINDOE, Alexander, M.D., D.P.H., Old Hayes, Sidmouth.
 1897 MACKENZIE, A. L., M.R.C.S.I., 6, Brock Street, Bath.
 1903 MACKENZIE, James, M.D.Edin., M.B., C.M., 68, Bank Parade,
 Burnley.
 1895 MACQUEEN, Thomas, M.B., C.M., 10, Bolton Road, Eastbourne.
 C. 1895-1901.
 1900 MAHOMED, A. G. S., M.R.C.S., L.S.A., Astolat, Bournemouth.
 C. 1902-
 1905 MANTLE, A., M.D.Durh., M.R.C.P.Lond., Savile Place, Halifax ;
 and 6, South Park Road, Harrogate.
 1899 MARSHALL, Augustine, M.D., L.R.C.P., 145, London Road,
 Lowestoft.
 1896 MARSHALL, J. N., M.D., C.M., 7, Battery Place, Rothesay.
 1895 MARTIN, Edward F., M.D., 7, Royal Terrace, Weston-super-
 Mare.
 1897 MAY, William Page, M.D., B.Sc., M.R.C.P., Helouan, Cairo
 (November to April) ; 9, Manchester Square (May to
 October).
 1897 McAULAY, Matthew, M.D., M.Ch., Kirkcubbin, Co. Down,
 Ireland.
 1899 McCALMAN, Dove, M.D., Oban, N.B.
 1897 McCANN, Frederick J., M.D., M.R.C.P., 5, Curzon Street, May-
 fair, W.
 1895 McCLURE, Henry, M.D., M.Ch., 36, Weymouth Street, W.
 C. 1895-01. V.P. 1899- C. 1903.
 1895 McFARLANE, Alexander R., M.R.C.S., L.R.C.P., 27, Milner
 Street, Chelsea, S.W.
 1897 McLAREN, Hugh, M.B., Ch., The Elms, Callender, N.B.
 1896 MERRALL, H., M.B., Ch., Glen Eldon Road, St. Anne's-on-Sea.
 1896 MERRICK, Horace T., M.B., 35, Talgarth Mansions, West
 Kensington.
 1897 MERRICK, Robert W., M.D., Ingleton, Basingstoke.
 1904 MICHIE, John Deloraine, M.B., B.Sc., Bell Rock, Bognor.
 1904 MILNE, Alexander, M.B., C.M., The Grove, Ilkley.
 1897 MILNER, Vincent, M.B., C.M., Oak Lodge, Parkstone, Dorset.
 1897 MINTER, L. John, M.D., M.R.C.S., L.R.C.P., 36, Sillwood
 Road, Brighton. C. 1902-
 1901 MITCHELL, R. Pryce, M.D., M.R.C.S., Villa Henri, Monte Carlo.
 1896 MOLLOY, Leonard, M.A., M.D., 3, Brighton Parade, Blackpool.
 C. 1903.
 1905 MOON, E. Gibson, M.R.C.S., L.R.C.P., High Beach, Victoria
 Parade, Broadstairs.
 1898 MORISON, Alexander, M.D., F.R.C.P., 14, Upper Berkeley
 Street, W.
 1896 MOUILLOT, F. A., M.D., B.A., B.Ch., Eton House, Harrogate.
 C. 1902-
 1896 MOXON, A. H., M.R.C.S., 44, King Street, Great Yarmouth.
 C. 1896-97.
 1895 MOXON, William, M.D., M.R.C.S., L.R.C.P., West View, Mat-
 lock Bridge, C. 1895-1900. V.P. 1900-02.

- 1899 MUIRHEAD, Claude, M.D., F.R.C.P., 30, Charlotte Square, Edinburgh.
- 1897 MUNRO, Seymour H., M.D., L.R.C.S., Nantwich.
- 1902 MURRAY, Gawler, L.R.C.S., L.R.C.P., 38, Gladstone Street, Scarborough.
- 1905 MURRAY, J., M.B., C.M., Park Terrace, Llandrindod Wells.
- 1901 MURDOCH, Andrew, M.B., C.M., 24, Albert Road, Bexhill-on-Sea.
- 1897 MUSGRAVE, C. B. Thomas, M.D., M.R.C.S., L.R.C.P., The Cottage, Lifton, N. Devon. C. 1899-01.
- 1896 MUSPRATT, Chas. D., M.D., B.S., F.R.C.S., Tantallon, Madeira Road, Bournemouth.
- 1895 MYRTLE, Andrew S., M.D., J.P., F.R.S.Ed., Harrogate. C. 1895-99. V.P. 1895-96. P. 1897.
- 1899 NAYLOR, Rupert George, L.R.C.P., L.R.C.S., Smythesdale, near Ballarat, Victoria, Australia.
- 1896 NEWINGTON, H. Hayes, M.R.C.P., M.R.C.S., The Gables, Ticehurst.
- 1901 NICHOLLS, John Michael, L.R.C.P., M.R.C.S., Penwyn, St. Ives, Cornwall.
- 1902 NIGHTINGALE, Percy Athelstan, M.D.Ed., c/o Standard Bank of South Africa, Cape Town.
- 1900 NOBLE, Stanley, M.D., M.R.C.S., L.R.C.P., 96, King's Road, Brighton.
- 1898 NOURSE, Stuart, C.M., M.R.C.S., L.R.C.P., Hurst Villa, Jackson Road, Clacton-on-Sea.
- 1902 ODDIN-TAYLOR, Gordon E., M.R.C.S., L.R.C.P., 46, Longmarket Street, Pietermaritzburg, Natal.
- 1897 ODELL, William, F.R.C.S., Ferndale, Torquay.
- 1896 OLIVER, George, M.D., F.R.C.P., M.R.C.S., Harrogate (June to October); Riversleigh, Farnham, Surrey (November to May). C. 1897-1901. V.P. 1897-
- 1895 ORWIN, Arthur W., M.D., 15, Weymouth Street, W. C. 1895-99. V.P. 1899-
- 1902 OWEN, John Morgan, L.R.C.P., M.R.C.S., Fishguard, R.S.O., S. Wales.
- 1897 OZANNE, Frederick N., L.R.C.P., M.R.C.S., Sheep House, Harrogate.
- 1896 PARDINGTON, Geo. Lucas, M.D., L.R.C.P., M.R.C.P.Lond., Glynlee, Tunbridge Wells.
- 1900 PARKER, Robert D., M.A., M.D., Caledon, Cape Town, S. Africa.
- 1896 PARSLÖE, Henry, M.R.C.S., L.R.C.P., 5, Buckland Terrace, Plymouth.
- 1895 PEARSE, William H., M.D., M.R.C.P., 1, Alfred Place, Plymouth. C. 1895-96.
- 1901 PECHELL, Major Sir A. A., M.B., C.M., Culverton House, Alton, Hants.
- 1900 PINKERTON, Charles, M.D., 6, Queen's Road, Southport.

- 1900 PLANT, James Robert, L.R.C.P., M.R.C.S., 8, Boon Place, Plymouth.
- 1895 POLLARD, Reginald, M.B., M.R.C.S., Godstone House, Sydenham. C. 1895-1900.
- 1900 POPE, F. M., B.A., M.B., M.R.C.P., 4, Prebend Street, Leicester.
- 1896 POPE, H. Campbell, M.D., 280, Goldhawk Road, Shepherd's Bush, W.
- 1899 POPE, Percy, M.D., L.R.C.P., M.R.C.S., 74, Mortimer Street, W.
- 1902 POWELL, O. E., M.D., Fontenelle, Jersey.
- 1896 POWELL, Sir Richard D., Bart., M.D., F.R.C.P., 62, Wimpole Street, W. H.V.P.
- 1896 PRINCE, J. Perrott, M.D., M.R.C.S., Durban, Natal. C. 1897-1900.
- 1897 PRITCHARD, Owen, M.D., M.R.C.S., 41, Gloucester Square, Hyde Park, W.
- 1898 PRUEN, Septimus T., M.D., M.R.C.S., Sherborne Lodge, Cheltenham. C. 1899-
- 1897 RANKING, John E., M.A., M.D., F.R.C.P., 18, Mount Ephraim Road, Tunbridge Wells. C. 1899- V.P. 1901-
- 1895 RAWLINSON, Fredk. J., F.R.C.S., Stuart House, Bognor.
- 1902 REID, Douglas A., M.D., M.R.C.S., L.S.A., 12, The Norton, Tenby. C. 1903.
- 1900 RENDALL, Stanley M., M.D., M.R.C.S., Les Palmeiros, Mentone (winter); Hotel Thermal, Aix-les-Bains (summer).
- 1896 ROBERTS, Francis, L.R.C.P., M.R.C.S., Church Road, Forest Hill, S.E.
- 1897 ROBERTS, Frederick T., M.D., F.R.C.P., 102, Harley Street, W.
- 1896 RODEN, Percy A., M.B., Frear Street, Droitwich.
- 1901 ROSSITER, George F., M.B., M.R.C.S., Cairo Lodge, Weston-super-Mare.
- 1901 ROUSE, Rolla, M.D., Winter Palace, Monte Carlo.
- 1899 RUSSELL, George, M.B., C.M., J.P., Claremont House, Oudtshoorn, S. Africa.
- 1899 RUSSELL, William, M.D., F.R.C.P., 3, Walker Street, Edinburgh.
- 1901 SANDERS, Gordon, M.D., C.M., Villa Nina, Cannes.
- 1897 SANDWITH, Fleming Mant, M.D., F.R.C.P., 31, Cavendish Square, W.
- 1896 SANSOM, Arthur E., M.D., F.R.C.P., 84, Harley Street, W.
- 1905 SAVILL, T. D., M.D.(Lond.), 60, Upper Berkeley Street, W.
- 1899 SCLANDERS, Alexander, M.D., 2, Academy Street, Nairn.
- 1896 SCOTT, John Walter, L.R.C.P., L.M., M.R.C.S., Highfield, 126, Tulse Hill, S.W.
- 1899 SCOTT, Thomas B., M.R.C.P. and S., Aldington, Poole Road, Bournemouth.
- 1901 SELKIRK, John, M.A., M.B., C.M., Boston Spa, Yorkshire.
- 1896 SHARPE, William Cecil, M.D., C.M., The Red House, Darley Dale.
- 1903 SHAW-MACKENZIE, A. C., L.S.A.Lond., Overstrand, Cromer, Norfolk.

- 1896 SHAW-MACKENZIE, J. A., M.D., 42, Green Street, W.
 1902 SIKES, Arthur Walker, M.D., M.R.C.P., F.R.C.S., 40, Argyll Road, Kensington.
 1901 SIM, Roderick, M.R.C.S., L.R.C.P., Villa Ciro, Monte Carlo.
 1900 SIMPSON, W. J. Ritchie, M.D., 13, Queen Anne Street, W.
 1896 SIMPSON, W. S., M.R.C.S., M.R.C.P., Heslington House, Worthing.
 1902 SMYTH, Wm. Johnson, M.D.Ed., The Hydro, Bournemouth.
 1896 SNAPE, Ernest, M.D., 41, Welbeck Street, W.
 1900 SNELL, Sidney H., M.D., B.S.(Lond.), Glenshee Lodge, Wandsworth Common.
 1895 SNOW, William V., M.D., F.R.C.P., 2, Richmond Gardens, Bournemouth. C. and V.P. 1895- P. 1897-98.
 1896 SOLLY, Ernest, M.B., L.R.C.P., Strathlea, Coldbath Road, Harrogate. C. 1896- V.P. 1901-
 1904 SOMERVILLE, Wm. Francis, M.A., B.Sc., M.D., Tyrefield House, Wilson Street, Hillhead, Glasgow.
 1896 SPICER, Scanes, M.D., 28, Welbeck Street, W.
 1897 SPILSBURY, Francis J., L.R.C.P., L.R.C.S., Hogsthorpe, Lincolnshire.
 1905 STANSBY, C. J., M.D.(Brux.), M.R.C.S., L.R.C.P., 56, Ludgate Hill, E.C.
 1896 STARTIN, James, M.R.C.S., 15, Harley Street, W.
 1895 STIELL, Gavin, M.B., 54, Elms Road, Clapham Common, S.W.
 1896 STOCKER, W. W., M.R.C.S., L.R.C.P., 253, High Road, Willesden Green, W.
 1896 STREET, Alfred F., M.A., M.D., D.P.H., Burghfield, St. Mildred's Road, Westgate-on-Sea. C. 1897- V.P. 1901- P. 1903.
 1897 SUMPTER, W. J. Ernley, L.R.C.P., Sheringham.
 1895 SUNDERLAND, Septimus, M.D., M.R.C.P., 11, Cavendish Place, Cavendish Square, W. Hon. Sec. 1895-
 1897 SWINHOE, George Rodway, M.R.C.S., L.R.C.P., New Swindon, Wilts.
 1902 SWORDER, Ernest G., M.B., L.R.C.P., Aldenham, 2, Clifton Road, Folkestone.
 1900 SYMES, Ernest, M.R.C.S., L.R.C.P., Craigmore, West Street, Scarborough. C. 1903.
 1902 SYMONS, H. B. Trehane, L.S.A., L.R.C.P., Trevalga, Lansdown Parade, Cheltenham.
 1900 SYMONS, William Henry, M.D., D.P.H., Guildhall, Bath.
 1897 TAYLOR, James A., M.B., C.M., Dunkeld, N.B.
 1897 TELLET, Frederick S., L.R.C.P.I., Auburn House, Ramsey, Isle of Man.
 1897 THOMAS, Abraham, M.B., M.R.C.S., L.R.C.P., 22, North Parade, Aberystwith. C. 1897-
 1895 THOMAS, Arthur W., M.D., "Carmelita," Crabton Close Road, Boscombe, Bournemouth.
 1896 THOMPSON, E. Symes, M.D., F.R.C.P., 33, Cavendish Square, W. H.V.P. P. 1902-03. C. 1903.

- 1896 THOMPSON, G. H., L.R.C.P., M.R.C.S., 1, High Street, Buxton:
C. 1900-2. V.P. 1903-
- 1902 THOMPSON, Henry E. Symes, M.A., M.R.C.S., L.R.C.P., 33,
Cavendish Square, W.
- 1901 THOMSON, Herbert C., M.D., F.R.C.P., 34, Queen Anne St., W.
- 1896 THOMSON, Robert, M.D., Ivydene, Sweyn Road, Cliftonville,
Margate. C. 1900-01.
- 1897 THOMSON, St. Clair, M.D., F.R.C.S., 28, Queen Anne Street, W.
C. 1901-02.
- 1898 THORNE, W. Bezly, M.D., 2, Harley Street, W.
- 1898 THORNE-THORNE, Leslie, M.D., B.S., 45, Inverness Terrace, W.
- 1896 THURSFIELD, Thos. William, M.D., F.R.C.P., J.P., Selwood,
Beauchamp Square, Leamington. C. 1896-98. V.P. 1896-
- 1904 TINLEY, William Edwyn, M.D., M.R.C.S., L.R.C.P., Hilvegard
House, Whitby.
- 1895 TOLLER, C. W. E., M.D., Castle House, Ilfracombe. C. 1895-
1902.
- 1897 TOWNSEND, R. H., M.B., B.A., M.R.C.S., Queenstown, Ireland.
C. 1897-8.
- 1897 TURNER, William, M.A., M.D., Gibraltar.
- 1896 TYSON, W. J., M.D., F.R.C.P., 14, Langhorne Gardens, Folke-
stone. C. 1896-1900. V.P. 1899-
- 1896 UNDERHILL, T. H., M.B., C.M., 54, Dulwich Road, Herne Hill,
S.E.
- 1902 VISE, Christopher, M.D., M.R.C.S., 39, Mount Pleasant Road,
Tunbridge Wells.
- 1898 WADDELL, Arthur R., M.D., C.M., Potters Bar, Middlesex.
C. 1901-03.
- 1903 WALSH, D., M.D., L.R.C.P., L.R.C.S., 18, Hanover Street, W.
- 1896 WAINWRIGHT, Lennox, M.D., L.R.C.P., 113, Sandgate Road,
Folkestone.
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